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**THE GLOBAL/NISSAN WAY TOWARDS MOTIVATION AND PRODUCTIVITY
IMPROVEMENT**

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About the author

Paul Harding has spent the last seven years working on developing management systems at Nissan South Africa. In 1993 he was given the responsibility of introducing a new Quality Management System that would comply with the requirements of the International ISO 9002 (1994) Quality Management System Standard into all of Nissan South Africa's manufacturing plants. This programme was started in 1993 and successfully completed in 1995 when the South African Bureau of Standards certified all five of the Manufacturing plants to the ISO 9002 Standard. Paul represents NAAMSA, the National Association of Automobile Manufacturers of South Africa, serving on the SABS Technical committee TC 176 for developing and approving ISO Standards for quality management. In 1998 he was invited to serve on the Working Group at SABS to develop, in conjunction with other International committees, a revised set of ISO Quality Standards for the new millennium. In this position he represented all of the Hardware (manufacturing sector) of South Africa. This new Standard is going through the final draft committee approval stage and should be published as an ISO International Standard by the end of the year 2000.

Paul is a regular speaker at commercial as well as industry-supported conferences with a focus on quality and business improvement. He has been a guest speaker at all six of the Institute for International Research's annual conferences on ISO 9000, endorsed by the SABS. Paul has recently expanded his focus to broader systems thinking philosophy with an emphasis on Japanese working methods. Since early 1998 he has been heading up the Nissan Plant Management System introduction process at NSA with the task of introducing Global Nissan systems at all levels in the organisation. Coming originally from a toolmaking background in the UK, he has had both practical and managerial experiences in engineering, quality and manufacturing environments. In 1999 he graduated from UCT with a post graduate diploma in Industrial Administration.

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List of abbreviations and terms

1. B90	The Japanese Engineering department issuing Standards
2. C & J	Chosen and Jissen meaning Challenge and Practice (Japanese)
3. CK 98	A programme introduced at NSA to promote cost reduction
4. CKD	Completely Knocked Down
5. Control Items	Targets associated with activities supporting objectives
6. EVP	Executive Vice President
7. Green Areas	Communication centres in the plant
8. GK	Genba Kanri meaning Shop floor Management (Japanese)
9. HK	Hoshin Kanri meaning Policy Management (Japanese)
10. iILU	Rating system used for skill of operators
11. ISO	International Organisation for Standardisation
12. JIT	Just in Time
13. Kaizen	Small gradual improvement (Japanese)
14. KPI	Key Performance Indicator
15. MBO	Management By Objectives
16. NML	Nissan Motors Limited
17. NPMS	Nissan Plant Management System
18. NSA	Nissan South Africa.
19. Poka Yoka	Mechanical 'Fool proof' device (Japanese)
20. PSI	Product Satisfaction Index
21. QC story	Logical method of addressing concern using QC tools
22. QMS	Quality Management System
23. SHE	Safety, Health and Environment
24. SOS	Standard Operating Sheet
25. SVP	Senior Vice President
26. Shoshin	New model introduction meeting (Japanese)
27. TGW	Things Go Wrong, used to measure quality defects on PSI
28. Top Shindan	Executive audit (Japanese)
29. TPM	Total Preventive Maintenance
30. TQC	Total Quality Control
31. U/M/M	Units per Man per Month, measure of efficiency

ABSTRACT

The perfect management structure would appear to be businesses run single-handedly and which by definition involves unanimous decision-taking, instant communication and the shortest, most direct chain of accountability! However, most managers operate within structures of some complexity, but the concept of attempting to act as one person, is worth pursuing, and I identify three main areas of management technique where the 'speak, think and act as one man' approach can greatly strengthen the Corporate effort. These are: Consistent and Predictable Decision-Making Processes; Dual Accountability; and Effective Communication.

Ray Horrocks, Chairman and Chief Executive Cars Group, British Leyland.15-9-1981.

This dissertation will attempt to recognise, understand and overcome the pitfalls in trying to implement the continuous productivity improvement concept behind the Global Nissan Way philosophy. Focus will be given to the Nissan Plant Management System (NPMS) product making map (refer figure 1.1 chapter one) developed by Nissan Motors Limited of Japan (NML) as a tool to improve productivity. This map, and its supporting methodologies, has been adopted by Nissan South Africa (NSA) in order to reach international benchmark production standards in terms of quality, cost, delivery and management. An attempt will be made to prove that before being able to successfully introduce this concept into South Africa, the eighth of Deming's fourteen points (Deming 1982) of Driving out fear in the workplace will have to be fulfilled. This will be accomplished by analysing the foundation of the NPMS Map, which states that; "A suitable atmosphere must be created to make the organisation energetic." It was identified in the final report, Harding P (1999), that a lack of focus and motivation on the shop floor was the main differentiate between NSA and successful plants in the UK Japan and Taiwan, in terms of quality, cost, delivery and management performance. The effect of the broad local external environment as well as the macro global environment will also be considered for its impact on accepting the system. A directive from Japan indicated that it was necessary for NSA to focus on constancy of purpose, as supported by the writings of W E Deming (1982), by using the Nissan Way framework. Results of daily quality and delivery performance continued to be sporadic after the initial introduction of this framework, although showing some degree of improvement.

This dissertation will try to show that further development work was needed to be carried out on the way the NPMS system was applied, in order to overcome many pitfalls and achieve the desired result of improvement to international benchmarks.

Obstacles to the implementation process will be highlighted including the attitude of senior management to understand and accept the necessary change in management style. This difference of culture of executive management will be considered, particularly focusing on the interaction of management and the workplace. The impact of senior executive audits, referred to as Top Sindan by the Japanese, will be analysed as a motivation for removing fear and encouraging self development and individual target setting at shop floor level.

Investigation will be carried out to critically analyse why Nissan South Africa failed to capitalise on its human resource to improve its competitive edge compared to overseas vehicle assembly plants. Based on these assumptions a problem statement will be developed. A strategy will then be formulated as to how the NPMS can be effectively introduced into NSA and be accepted at all levels in the organisation. Basic improvement items will then be considered within each production area and also support functions and the results will be collected and analysed against the desired target. Possible outcomes will then be discussed to predict the influence that a revised shop floor approach will have on the future of Nissan South Africa if correctly implemented. A strategy will then be formulated as to how Genba Kanri (shop floor management) can be used in terms of improved knowledge by shop floor personnel and at the same time be accepted by all levels in the organisation. The Hoshin Kanri process for the year 1999 / 2000 will be compared to the previous business plan period. Discussion will then follow on how more meaningful objectives can be developed for NSA to meet its targets for improvement.

The Hoshin Kanri process will be used to develop clear objectives for the company to meet its targets for improvement. Cross-pollination of objectives and control item targets will be tested in order to establish whether constancy of purpose as prescribed by W E Deming (1982) and discussed by P Harding (1999) have been achieved. Various review methods will be used in this process.

The dissertation will follow the action learning process and the problem statement will be tested. Results of all the actions will be analysed and interpreted data will be presented to support each claim. Reflections will be considered as to whether the proposed plan and anticipated results were as predicted. Finally a judgement will be made as to whether the modified activity and the revised plan, achieved the anticipated results that were predicted.

CHAPTER ONE

BACKGROUND TO THE CHANGE PROCESS AT NISSAN SOUTH AFRICA AND THE INTRODUCTION OF THE JAPANESE PLANT MANAGEMENT SYSTEM

1.1 Background to the change process at Nissan South Africa

Nissan South Africa (NSA) have been assembling vehicles for forty years and in that time have journeyed through many change processes. None have been more dramatic than the last seven years during which NSA have attempted to fully introduce Japanese work methods and production systems. Recently the French Company Renault have acquired a controlling interest in Nissan Motors Limited (NML) of Japan and this has further added complexity to the change process.

1.1.1 The history of the organisation

The Nissan South Africa Manufacturing Company was originally known as Rosslyn Motor Assemblers and was founded in 1960 in Rosslyn north of Pretoria. The plant started off as a general assembly plant that assembled a variety of different models from many sources including BMW, Datsun, Chrysler and Fiat. The original founders were local South African entrepreneurs who were very much “hands on” practical Managers with a focus on short-term profit. The focus in the early years of the Company was not placed on consistency of management in terms of productivity and quality achievement instead more focus was given to delivery and volume. There was very little Standardisation in terms of written procedures or work instructions and no formal quality management system existed. The key measures of success were the Vehicle Evaluation System (VES) results relating to quality and Monthly Into Stock figures relating to achievement of volume. In 1993 a newly appointed Managing Director of NSA attempted to introduce the concept of utilising Japanese management systems in the form of the newly developed formal documented system known as the “Nissan Way”. This Japanese Assembly

Plant control system, which was documented and described in a series of standards, was collectively known as the Nissan Plant Management System (NPMS).

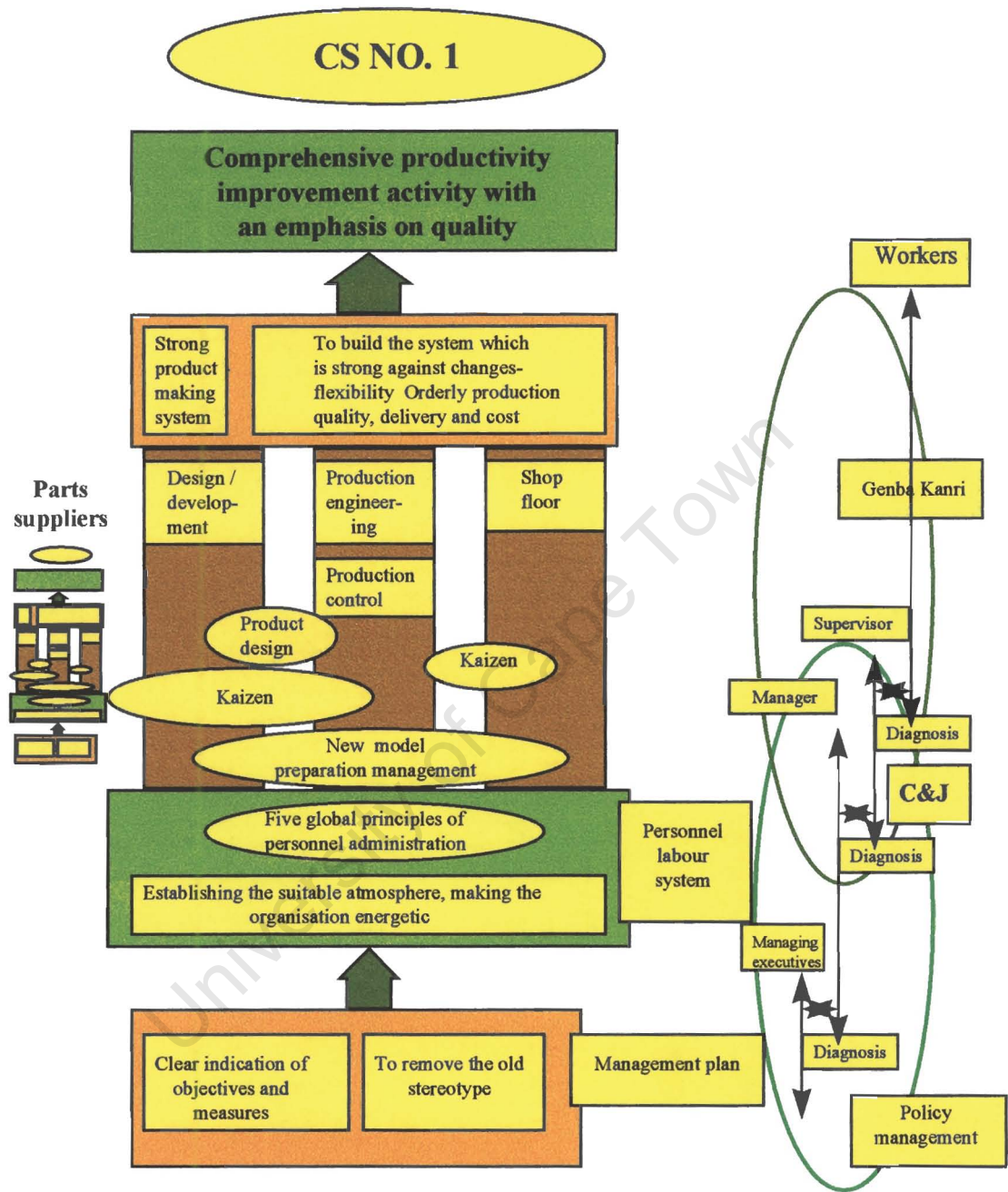
1.1.2 The introduction of Japanese philosophy

Although Japanese philosophy was not new to NSA there appeared to be only a shallow understanding of the main concepts of Deming (1982) and his management philosophies by senior NSA executives. Deming principles were still seen as being relevant only to the Quality Assurance department and not being generally applicable to the rest of the organisation. NML had set up a Japanese liaison office at NSA and advisors were available to give support on production and technical issues, which were model related. There was little if any interaction between the Japanese advisors and middle management relating to system changes and cultural development and no Japanese had line management responsibilities. Most of the interaction that did take place was at the senior executive level or on the technical development issues with little discussion taking place regarding the philosophy of W Edwards Deming or his fourteen management principles. Harding (1999) established in the report submitted to UCT that large proportions of these Deming principles have been adapted for use in the “Nissan Way” Plant Management System.

1.1.3 What is the Nissan Plant Management System?

The purpose of the Nissan Plant Management System and the “Nissan Map,” which illustrates the broad philosophy, was to ensure that a standardised approach was used for each overseas assembly plant. This Nissan map was created by the engineering department B90 in Japan of the Nissan Motors Limited (NML) company. It is a collection of various methodologies and philosophies that when integrated together can be used by all Nissan assembly plants worldwide. It has a dimension of continuous improvement to it that takes the form of Hoshin Kanri (HK) which is translated as Policy Deployment. The NPMS framework as shown in Figure 1.1 the NPMS map, is being used as a tool for this purpose.

Figure 1.1 The NPMS Map



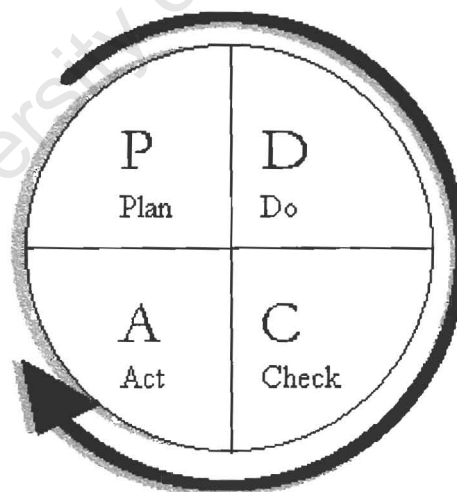
This drive to introduce a standardised approach was to support the Nissan head office's global objective of each overseas Nissan Plant becoming the number one customer satisfaction rated company in each country. It was suggested by NML's head office that by using the NPMS as a tool for improvement, this would lead to Nissan becoming a worldwide leader in

Quality and production efficiency. This drive is based on implementing a strong manufacturing plant product making system. The system was designed to be strong, flexible and capable of absorbing change and be used anywhere in the world. In order to meet the goal of superior customer satisfaction the model and the daily management activities supporting it is subjected to the Shewhart PDCA cycle of continuous improvement which is frequently referred to by Deming (1982)

1.1.3.1 The PDCA cycle

Walter Shewhart, the pioneering statistician who developed statistical process control in the Bell Laboratories in the US during the 1930's, originally developed the concept of the PDCA Cycle shown in Figure 1.2. It is often referred to as 'the Shewhart Cycle'. It was taken up and promoted very effectively from the 1950s on by W. Edwards Deming, and is consequently known by many as 'the Deming Wheel'.

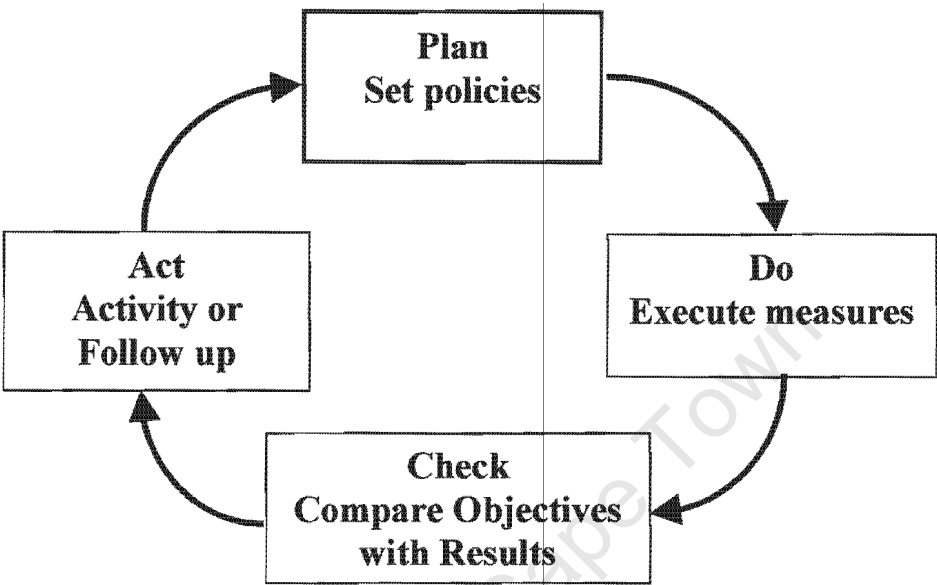
Figure 1.2 the PDCA cycle



This improvement activity is first specified in the form of standardising all activities and then using the principle of Kaizen, as discussed by Imai (1986) to introduce gradual improvement activities. The PDCA cycle is also implemented through the Hoshin Kanri establishment process. This process

follows the following cycle and its review principles, as shown in Figure 1.3 PDCA and Hoshin Kanri

Figure 1.3 PDCA and Hoshin Kanri.



1.1.4 Engineering support from Japan

The continued support for the NPMS is given by the Engineering department of the Nissan Japan head office (NML). The support is given in the form of Standards and analysis through audit of the interpretation of how these Standards are applied in terms of use and effectiveness. Each manufacturing plant should then be unilaterally focused to achieve improved customer satisfaction results. It is this collection of methodologies and philosophies that when integrated together can be used by all Nissan assembly plants operating world-wide to achieve success. This supports the Deming (1993) principle of management's appreciation for a system. The NPMS is seen as an all encompassing manufacturing system in that it covers all the processes necessary in the manufacture and assembly of a motor vehicle. It not only covers the actual assembly process but also the support activities including

Logistical, Engineering, Quality Assurance, Product Development processes as well as the Human Resource factor. All these processes are supported by more than eighteen hundred best practices that have been developed and translated from many of Nissan Japan's top plants by the Japanese engineering department. These Standards which cover all functions are listed as follows:

- SB01 Overall
- SB02 Stamping
- SB03 Body and Metal
- SB04 Paint
- SB05 Trim and Chassis
- SB06 Unit (Engines)
- SB07 Shop floor management (GK)
- SB08 Production Control and Logistics
- SB09 Safety and Health
- SB10 N-PES (New model introduction)
- SB11 N-PEG
- SB12 Maintenance
- SB13 Quality
- SB14 NPMS

The NPMS relies heavily on a defined methodology of introduction that is described in the SB14 series of Standards. As in most activities where a result needs to be determined, there are different levels of achievement based on knowledge and understanding of the subject. The Japanese have broken down these levels into very specific categories by use of a functional step-up diagnosis method. Each plant is rated on its level of overall achievement. The lowest rating being one and the highest rating being five. Once a plant has reached level four as determined by a third party audit from Japan, they are no longer subjected to audit from the parent company. There are also two levels of diagnosis, the first being more philosophical and the second being more functional. Only after reaching step-up level four on all categories of both the

philosophical and functional levels would Japan consider an overseas Company has implemented the Global Nissan Way philosophy successfully. It is important to note that the NPMS only directly covers manufacturing and assembly plants and excludes corporate and marketing activities. This has been one of the outcomes of the Renault / Nissan merger where the French have recognised the weakness of the NML finance and marketing systems which have not been extensively documented. A cost focus at NSA has become increasingly more important since the take-over of the NML operation by the French Renault Company.

1.1.5 The Role of Executive Management

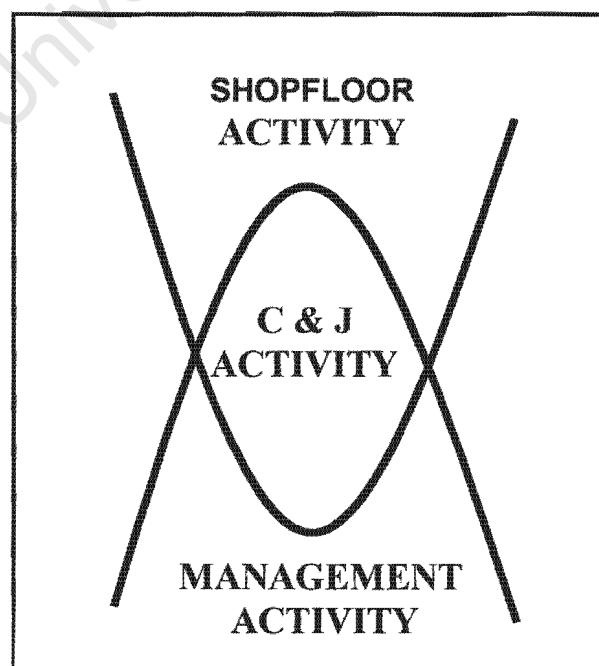
Clemson (1984) states "The characteristics of the manager obviously influence the organisation being managed". He goes on to say "*Managers have a choice in how they choose to perceive their organisations and in what they choose to perceive about those organisations.*" This has manifested itself in NSA by various senior executives seeing the organisation in different ways. The previous Executive up until the appointment of a Japanese Executive Vice President (EVP) in 1999, had an approach of encouraging the presentation of superficial data at various Operation meetings. This data did not always reflect the true situation in the organisation but made the group feel good in that they were seen to be achieving set goals, even though often those goals were of little consequence. The new Japanese Executive paid much more attention to detail and wanted to see actual results and more significant data, even if it were not as expected or desired. This is supporting Deming's (1982) eighth of his fourteen point for management of "*Driving out Fear.*" This change of approach is critical if the organisation is to create the suitable atmosphere to become energetic as prescribed in the NPMS map shown in Figure 1.1. By driving out fear the data presented at operations meetings and the subsequent questions asked in terms of Quality, Delivery and Cost issues could be more supportive of the goals set. Corrective actions and new activity plans addressing data from the previous periods could now be more relevant.

By addressing relevant data that was drawn from the shop floor specific improvements could be made but only with full support from the actual production areas. This also meant that the climate of fear had to be removed at shop floor level as well as at senior management level.

1.1.6 The Challenge and Practice of setting improvement targets at foreman level

According to the Japanese advisors who are stationed at NSA, the NPMS will only work effectively when an interface has been created between management and the shopfloor. This is shown in Figure 1.4. Linking Management and Shop floor. The Japanese see the foreman in an intermediary role that is bridging the gap between management on the one hand and the operator on the other. The Japanese sees this as a function of leadership rather than a command function. It is only by showing leadership qualities that the true voluntary challenges from the shop floor can be expected. A command function would not achieve this.

Figure 1.4 Linking Management and Shopfloor.



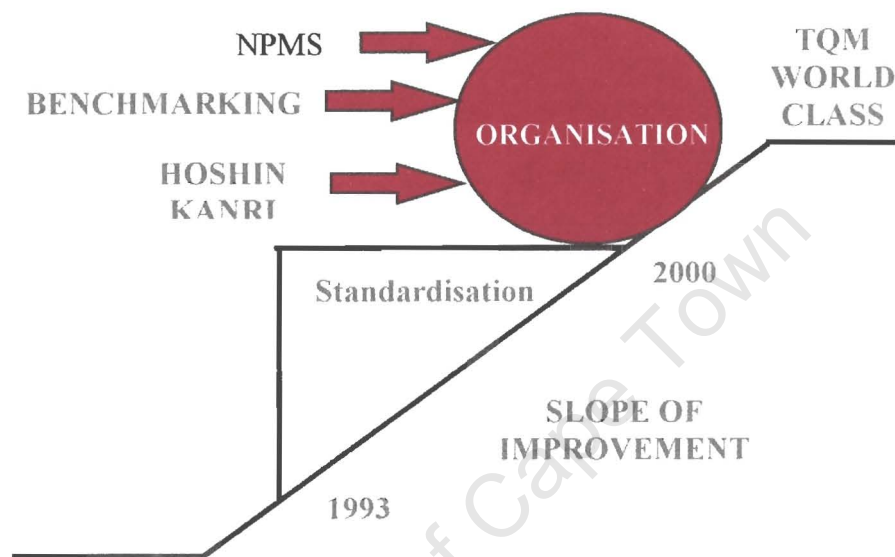
For an improvement process to be successful it must have ownership from the people who are directly involved with the actual process. The foreman has an important role to play as the interface between management demands for greater efficiency and the worker demand for performance support. The strength of the Japanese system is the level of involvement from each foreman. The foremen set improvement targets by themselves in terms of a challenge to management that supports the overall goals of the company. Each foreman then puts these challenges into practice after approval in principle by management. This concept is referred to in Japanese as Chosen and Jissen (C and J) or translated into English as challenge and practice. These measurements could take the form of, amongst others, the improvement of the quality output from a process or the achievement of schedule for delivery measured daily, weekly and monthly or it could also take the form of a number of cost elements. The important issue related to the C and J process is that the targets set must be voluntary and worked on without fear of reprisal if targets are not met. It is this aspect of Deming's (1982) teachings from his fourteen points for management that has been most misunderstood by Western management, there is still a tendency in Western style management to force results upon subordinates and punish under achievement.

1.1.7 Standardisation as a basis for improving knowledge

The NPMS framework relies on the implementation of Standards as a basic foundation for ongoing improvement. Dale (1994) supports this view and saw the ISO 9001 (1994) Quality Assurance Standard as a support for the ongoing quality improvement process based on the ongoing audit of a documented system. This philosophy can be taken further and we can see Standardisation in the broader sense supporting the organisations drive for improvement to world class performance through the sharing of knowledge. The technical knowledge accumulated by NML is rearranged and made common as Engineering standards for use in all overseas manufacturing companies. This makes it possible for the 'Nissan Way' to be promoted by the CKD plants in

each country so that anyone can produce vehicles of the same quality in the same way.

Figure 1.5: The role of standardisation



Donald J Wheeler (1993) quoted Daniel Boorstin who said “*Information is random and miscellaneous, but knowledge is orderly and cumulative.*” Wheeler goes on to say before information can be useful it must be analysed, interpreted and assimilated. The Japanese, in line with the previous statement, believe that a standardised view of knowledge must be created in order to use acquired knowledge correctly to interpret information. This approach to standardisation is supporting the NPMS as a driver of a broad all encompassing system based on Japanese improvement philosophy, as discussed by Deming (1982). It was identified earlier in this section that supporting the NMPS in Japan were a series of more than eighteen hundred best or better practice procedures. This was very much similar to the NSA current Quality Management System (QMS) which NSA had used for its ISO 9002 (1994) introduction programme. The main difference however, was identified to be the fact that the NSA approach to systems based on ISO 9002

(1994) had paid little attention to the clause supporting the use of statistical techniques which could handle variation. The standardisation supporting the NPMS drive as shown in Figure 1.5 The Role of Standardisation, on the other hand had many volumes supporting analytical methods and the Japanese recognised the importance of handling variation. The main difference between the two approaches to standardisation was that the documented approach by NSA was based on previous local practices that historically had not achieved satisfactory results. On the other hand world class results had emanated from the NPMS framework which was based on proven standards, developed by top Japanese engineers. These standards were based on eliminating variation from the process and each standard was linked to a performance result. The challenge that now presented itself was how to transfer knowledge to handle variation to the shop floor by using these standards as a base for improvement.

1.1.8 The NPMS as an improvement tool

The NPMS map referred to in Figure 1.1 shows that the foundation step for improvement is to establish a *“clear indication of objectives and measures”*. Wheeler (1993) warns of the boss in despair who is asking, *“Why are the numbers so bad and how are you going to get the workers to work harder?”* The NPMS map qualifies this statement by saying that we must *“renovate the old stereotype”* which is implying that a paradigm shift is needed in setting new goals and objectives but based on process improvement and control of variation. The Japanese use Hoshin Kanri, interpreted as Policy Deployment or Policy Management, to cascade goals and objectives through the company to lower levels of operation. A management plan must be developed to achieve these new goals and objectives, but it is essential that this plan is applied throughout the organisation and, above all, the workforce must support it. The step up diagnosis for the shop floor, refer to Appendix 1, as prescribed by NML in Tokyo is an important aspect of the NPMS and all its constituent parts. What needs to be stepped up must be based on the interpretation of data

that is emanating from the shop floor. The step up diagnosis is referring to the operational meaning of the NPMS that is aimed at improved Customer Satisfaction following removal of variation which should lead to increased productivity and reduced waste as presented in the NPMS map. This can be summarised as follows:

- Create a standardised approach to operations based on consistency of process.
- Develop the process based on sharing knowledge of variation
- Develop a management plan to improve the process and eliminate variation that can be cascaded down to all levels.
- Check the plan and act on its implementation.
- Monitor the manufacturing shop floor where the real results happen.
- Take care of personnel and labour issues and ensure motivation through driving out fear.
- Utilise production engineering and staff effectively to identify real causes of variation.
- Hold the improvements through re-standardisation.

Nissan Motors Limited in Japan have learned from their experiences and were quick to utilise Deming's (1982) various theories of management practice. The worker who is performing the activity can only achieve the real improvement in the quality of the job he is doing and achieve the required productivity levels if he has the motivation and knowledge of the job. Likewise the engineer in Japan is only recognised when all aspects of the process have been established to achieve consistent results that establish process capability. The operator and engineer and not just senior management must understand what is required to achieve a common approach to the broad implementation of the Nissan Way of Quality and Productivity improvement. This deep understanding is often lost by various levels in the organisation in the quest to achieve points on the step up analysis score associated with the introduction of the system.

1.2 Revising the view of the NPMS from within NSA

A view has been taken of the NPMS as an improvement tool supported by a knowledge base comprising of best practices. Various levels within the NSA organisation have not always shared this view. A study needs to be made of the NPMS from the perspective of different operational levels within the organisation. Harding (1999) showed that the Japanese liaison members at NSA had different views themselves of the NPMS. After further study it has been established that this understanding varies based on which plant in Japan each member has received training at, and also at what level the individual had been appointed in that organisation. It was decided to present an awareness programme to various lower levels of management within NSA using a questionnaire to establish understanding levels. The questionnaire comprised of the following questions:

1. Do you understand what Hoshin Kanri means?
2. Do you think it is necessary in NSA?
3. Have you completed a Business Plan this year?
4. If yes did you discuss it with your superior?
5. If yes did you agree on Control items with your superior?
6. Do you think NSA is capable of competing with international Nissan operations like the one in Taiwan?

The result of this questionnaire, completed by 87 respondents, indicated that 80% answered positively to question one in that they understood what Hoshin Kanri meant. 97% felt that it was necessary to introduce it into NSA. Only 72% of respondents had completed a business plan and only 43% had agreed upon targets with their superiors. On a positive note 82% of respondents felt that NSA was capable of competing with the Nissan plant in Taiwan. Interviews then were conducted with representatives of various groups as to

their understanding and support of the Japanese system. Some of the comments follow:

1. "I'm really starting to understand the Japanese way and it seems the way to go."
2. "This system is a very good way to motivate employees to improve their skills and see job opportunities and activities within the parameters of their jobs."
3. "For the first time I am now able to understand how a Business Plan is supposed to work. I know that the way we were doing it was completely wrong. I believe that there was no-one in my department that has been doing it correctly in the past".
4. "It is a lot of theory, but is it practical in a South African set up? We have to do some changes to the Japanese way to suit our environment"

It was evident that a diverse opinion was present as to the outcome of using the NPMS supported by Hoshin Kanri and also its potential in South Africa. There was also not a commonality of understanding within the Japanese group currently working as advisers at NSA when they were interviewed. Whilst most of them were familiar with the Genba Kanri principles and the concept of the Nissan Product Making Map, there were many interpretations of the broader principles of the NPMS system, particularly the application of B90 Standards. It was evident that most Japanese had developed their own working methods as a matter of good practice and practical experience and did not necessarily refer to a particular documented Standard. The majority of support staff at Nissan South Africa had a common interpretation that it was a measurement system. This measurement system was understood to record results of Key Performance Indicators (KPI's) set by senior management which reflect the performance of various metrics against set targets. It is true that the NPMS implementation programme requires measurement, but the actual measurement is against a series of defined introduction steps. It is from these steps that the Japanese have formulated the Step up Diagnosis sheets that are referred to later in this chapter. The challenge is to link functional step up

improvement with standardised performance relating to set functions to achieve good results. NSA has been operating for some time to a fairly comprehensive standardised system in the form of formal procedures, developed for ISO 9002 (1994) conformance, work instructions and Standard Operation Sheets (SOS's). These activities are regularly audited and conformance to desired actions are reported to senior management. Both management and the lower levels of direct and indirect workers are sometimes confused as to what is required of them in terms of defined policy and procedures plus GK audits and functional step up diagnosis. The following sections reflect some changes in the original mental models of some of these areas and the subsequent mental model change.

1.2.1 Mental models of senior management in Nissan South Africa

Various Directors from both Marketing and Manufacturing had given allegiance to the concept of introducing the NPMS and the Hoshin Kanri process over the past seven years. This was verified by a questionnaire given to seven executives following a training workshop on introducing the Japanese Hoshin Kanri philosophy given on the 27 July 1998.

Extracts from the survey statements, to which the executives had to react, are shown below.

1. "Top management's commitment to Hoshin Kanri is essential."
2. "Based on the workshop top management's commitment is evident".
3. "The Hoshin Kanri process will ensure that my objectives are aligned with those of the company."
4. "The process explained today is practical and once implemented will assist the company and its employees in achieving the objectives defined by top management".
5. "I support management's efforts to implement Hoshin Kanri effectively."

On a scale of five with one being in total agreement and five being in total disagreement, the executives answered as follows. All of executives strongly agreed with statement one. With statement two one strongly agreed, three agreed and two were neutral and one abstained from answering. Four strongly agreed, and three agreed with statement three. Five strongly agreed and two agreed with statement four. Six strongly agreed and one agreed with statement five. Until the take-over of the Company by NML in 1998 there seemed to have been a lack of faith in the Japanese system actually being able to enable the desired result in terms of turning the company into profitability. Mentz (1997) found that the implementation of Japanese systems in NSA did not yield the same result as in NML and NMUK for the following reasons:

1. A lack of understanding and knowledge of the systems and their underlying philosophies at all levels in the organisation.
2. Insufficient commitment and participation at all levels.
3. Insufficient planning of the implementation.
4. The relevant human factors were not taken into consideration.

Mentz recommended two basic requirements for the sustained successful implementation of any new system:

- It must be systemically viable
- It must be culturally acceptable

Harding (1999) concluded that although the Japanese system itself was sound and systemically viable, he supported Mentz in that the human factor must receive much more attention if it is to work in a South African environment. He recommended also that the morale of the workforce be taken into consideration. The morale of senior management was very low in private conversation although they showed support for the Japanese methods in public. The external environment also had to be taken into account when addressing workplace morale.

1.2.2 Mental model changes following the appointment of a Japanese Vice President

With the early retirement of the incumbent Managing Director of NSA in 1999 a Japanese national was appointed in the position of Managing Director later to become Executive Vice President (EVP). This appointment had a large influence on the remaining executive members and their mental models. The most striking change was how the new EVP requested a more detailed presentation at the various Operations meetings in that all presentations were to be based on facts and true data rather than vague information and general rhetoric. This was the first sign of fear being driven from the boardroom with actual facts being presented by most executives. There was still reluctance, however, of some executives to openly show the true situation. They had retained their previous mental model of the best option being that of hiding concerns from the senior executive. At first it was difficult to interpret the intention of the changed format of these meetings which had moved from general debate to specific analysis and follow-up activities. After further research it was found that there was a standard B90 document that had been issued from Japan, which actually prescribed the way that executive plant meetings should be run and this fitted the new approach. However, the standard also quoted other meetings at various levels in the organisation as being important to feed into the higher level meeting. These meeting were not yet in place at NSA. This supported the theory described by Ackoff (1994), "That when parts are taken away from the whole they have little substance." The new EVP was now trying to implement part of the NPMS in the form of a new meeting agenda; however, the mental models of the rest of the executive had not yet changed to accept the new approach. Business Plans soon became the focus for discussion at the operations meetings, supporting Deming's (1982) first principle of *"Creating constancy of purpose for continued improvement of product and service."* Over a short period of time the content of data presented at each meeting became more appropriate and focused on the

organisation's Quality, Delivery and Cost objectives. This was the first sign of a mental model change from the NSA executive.

1.2.3 The role of Top Sindan audits

One of the first major changes in approach from the new EVP was to introduce a new concept into NSA, which was referred to as a Top Sindan audit. The literal translation of this from the Japanese is "top executive audit". This entailed that the EVP personally conducted audits at each department to understand for himself what performance level was being achieved by each department. These audits did not appear to be structured as in a normal ISO 9001 (1994) audit. There was no formal check list or report format that was used by the EVP. At first it appeared as though they were very informal and impromptu. Each division would be scheduled for audits based on the current level of performance and the impact on the company targeted goals. In the first twelve-month period a total of fifty audits were scheduled. The aim of each audit was to monitor improvements to the system of production and service areas supporting production. Each level was then questioned by the EVP and the activities were assessed that supported each business plan item. This seemed to support Deming's (1982) fifth point of *improving constantly and forever the system of production and service*. It was up to each individual being audited to listen to any advice given and act upon this advice. There was no direct criticism, only comments on improvement opportunities. If an area had been seen to be successful the only comment from the EVP would be that the performance to date was "very good".

1.2.4 The need to change focus from quality improvement to cost reduction

For the previous seven years the main driver at NSA had been a focus on quality improvement. This focus had been supported with the introduction into NSA of the ISO 9002 (1994) Quality Standard as described by Harding

(1999). A view on cost related to quality was supported by Deming (1982) who talks about the chain reaction of improving quality. He says quality reduces rework and mistakes, which leads to productivity improvement, which results in increased market share, which enables the organisation to stay in business, which provides more jobs. Despite the focus on quality improvement, NSA had not made a breakthrough in terms of reducing its costs and improving its profitability. Market share had not been improving as forecast by Deming (1982). This situation led to another change in management style in terms of the Business Plan focus. The pace at which cost improvements were being achieved was not quick enough for the new management. Focus thus was moved from Quality to Cost. Already a programme was in place known as 'CK 98', which focused on increasing the Kaizen concept, as discussed by Imai (1986), and reducing Cost. It was unfortunate that the 'cost down' part of the programme was interpreted by most of the company as eliminating expenditure rather than reducing waste, which was the philosophy supported by Deming (1982). The cost reduction drive led to job losses rather than job creation as forecast by Deming. This created a negative approach to supporting the drive for improving profit at shop-floor level. The appointment of a new Genba Kanri specialist from Japan gave new impetus to the approach of shop floor improvement and a new training programme was developed.

1.3 Japanese shop floor focus through Genba Kanri

Deming's (1982) sixth point says that *we must institute training on the job*. The Japanese refer to the shop floor as the "Genba." and Kanri as management, so Genba Kanri (GK) is management of the shop floor or on the job. The Japanese are supporting Deming's principles when they say that focus must be given to the area where the "real" work is being done. Training is seen as important but training must be based on the specific Standard developed for doing the particular unit of work that each operator is

performing. The basis of training on the shop floor is the Standard Operation Sheet, which explicitly defines the detailed activity to be performed.

1.3.1 Basic shop floor step up activity

Each Standard operation Sheet (SOS) describes an explicit way of performing the work, including the time to perform the operation. In order to improve the operation and step up productivity and quality performance, the basic application of work must be constantly improved. Measuring the operator against the SOS and ranking him on a specific skill level does this. The operator is seen to have mastered the SOS when he can perform the task as described explicitly within the time frame allowed. The step up comes when each SOS can be consistently improved in terms of obtaining the desired result with no defect outflow of the operation within an improved time scale. This theory will only work effectively if each Standard is consistently applied with no variation to the process. This GK application which standardises each operation falls in line with Deming (1982) when he says, *"Improve constantly and forever the system of production and service."*

1.3.2 The revised role of the foreman

Deming's (1982) seventh point called for *"the adoption and institution of modern methods of supervision and leadership."* The Genba Kanri step up method supports this principle with an emphasis on the role of the foreman to promote improvement of the workplace. Since 1990 NSA have been promoting the concept of GK implementation. Only in the last year, since the introduction of the 1999/2000 Business Plan, has this role of the foreman been redefined. In Japanese plants, the foreman plays a pivotal role in improving shop floor performance in line with Deming's thinking. In South Africa the foreman was more seen in the role of overseer than that of playing a leadership role. In the revised GK step up programme at NSA introduced in 1999, it was established that the foreman needed to be seen to play the role of leader in

productivity and quality improvement. The NPMS requires that the foreman develop his own Business Plan, but before this can be realised the knowledge of the foreman had to be enhanced with regard to improvement methods.

1.3.3 The need for training

Deming (1982) refers to training on the shop floor. He said that *'if a man's work has not yet reached a state of statistical control, then further training would help him achieve this state. However, once in statistical control, further training is not relevant unless there is a need to change the task being performed.'* The shop floor at NSA was not in control and a change was needed to be put in place to reach the revised output and quality requirements. In order for the foreman to be able to adopt the role of leader rather than overseer, his shop floor management techniques had to be reinforced. Peter Senge in his contributing article Rethinking Control and Complexity, Gibson (1997), talks about *creating a learning infrastructure so that you do not leave learning to chance*. He goes on to say that there are three basic areas in which a learning infrastructure must operate:

- Practical experimentation and testing
- Capacity building and diffusion
- Standardisation.

The NPMS, as we have pointed out in Section 1.1.6, relies on standardisation as a support for its ongoing improvement philosophy. Against this background of standardisation seven basic modules for building the capacity of each foreman were developed by the NML engineering section in Japan. These modules had previously been referenced in the GK step activity plan, developed by the NSA human resources department, but the content was not fully understood. A cross-functional team set up by NSA including assistance from a new Japanese advisor then modified these modules. Tests were then developed after training sessions were given to the foreman to establish the

level of understanding achieved. The new EVP insisted that the foremen in the organisation take more responsibility for their own improvement activities including developing their own shop floor man-assignments to improve productivity.

1.3.4 Revised responsibility of supervision

Foremen were now expected to show leadership qualities in developing their sections to achieve newly established targets. Deming (1982) described the aim of leadership as being able to *improve the performance of man and machine, to improve quality, to increase output and to simultaneously bring pride of workmanship to people*. According to Deming the leader also has the responsibility to improve the system, that is to make it possible, on a continuing basis, for everyone to do a better job with greater satisfaction. The role of the foreman was now expected to cover six major aspects of the shop floor. These were in line with the training modules developed and are listed as follows.

- Operation control, which focuses on optimising production
- Quality control, teaches use of QC tools
- Operator control, focuses on work force motivation
- Cost control, is an awareness of shop floor economics
- Safety control, based on SHE requirements
- Equipment control, basic maintenance methods

Each of these modules formed the basis of shop floor improvement but the foremen had different abilities and backgrounds for understanding the basic principles behind each module. In Japan each potential foreman has to master these six modules before being considered for appointment to a foreman position. In South Africa none of the current foremen had studied these modules prior to appointment. This situation has been recognised as one of the biggest differentiates between NSA and NML companies. The foreman's

role in Japan is pivotal to the success of each section and if NSA is to compete in the global economy this situation must be rectified. Wickens (1987) supports this theory. He quotes the Ford Motor Company that has recognised that the days of the foreman as a production chaser are numbered. He goes on to say that *Ford has recognised that supporting, guidance and coaching will be the nature of leadership in the future.*

1.3.5 The need for re-training

The first cycle of training of the foremen had revealed that although a score could be achieved in terms of rote learning of a described set of practices, taught by a Human Resource specialist, actual knowledge had not significantly improved. The results of this training, however, were distributed to senior management and the Key Performance Indicator (KPI) was met by the Manager of the section, who had achieved his training target, and the HR trainer had also delivered his training course. The effectiveness of the training, however, was overlooked in terms of the end result. Each foreman level was not meeting objectives and targets because the focus had been on the training KPI and not the actual activity on the shop floor. This situation created a need to start a re-training programme. A new GK advisor was dispatched to NSA to work directly on the shop floor to assist in the training of the foremen.

1.4 Identifying the reasons for past improvement initiative failures

"What makes a scientist great is the care that he takes in telling you what is wrong with his results, so that you will not misuse them."

W. Edwards Deming

The previous paragraphs have covered various initiatives that were introduced to improve output and improve quality. There was still an element of fear in the organisation in that no one was able to freely tell the situation as it was in terms of the operation not being in total control.

1.4.1 Lack of trust between management and workforce

In the quest to achieve productivity levels that are compatible with Japanese and other overseas assembly plants in terms of the International level of Units / Man / Month, job ratios became a NSA focus item. In the past retrenchments had followed this practice and any subsequent initiative to improve productivity was seen by the workforce as another attempt by management to further reduce headcount. This situation of attempted productivity improvement developed into a lack of trust between management and the workforce. This lack of trust was particularly evident in that in the past few retrenchments affected senior management. The foreman was then reluctant to be seen to be part of the improvement process, as this would label him as part of the “enemy” by the workforce. This made it difficult for the foreman to perform the same role as the foreman in Japan, which was more of a coach and mentor rather than a pure supervisor.

1.5 The climate of fear in the organisation

If we evaluate the organisation at all levels from the executive through to the shop floor, we will find that although the NPMS calls for a suitable atmosphere to develop the organisation, an atmosphere of fear was actually prevailing. Deming’s (1982) acknowledgement of the people issue as being key to the improvement process had been underestimated by both the South African management and their Japanese advisors, in the quest to adopt the NPMS system. If we test the NPMS against Deming’s key point of people issues we find that the “Nissan Way” philosophy is indeed a culture that suits the Nissan Japan operation. Callaghan (1998) reported that a NSA employee felt that the single biggest thing about Japanese management was their consistent approach. Callaghan also reported that Japanese system applications did vary between Japanese plants and the Nissan UK plant. Callaghan went on to say *‘it can be argued whether Nissan South African can*

absorb the unique cultural requirements necessary to operate the system as defined by their Japanese counterparts'.

1.5.1 The need to create the suitable atmosphere for success

Harding (1999) spoke about Deming's (1993) Theory of Profound Knowledge indicating that the transformation of management comes from the understanding of the System of Profound Knowledge. *The individual transformed will perceive new meaning to his life, to events, to numbers, to interactions with people.* Knowledge must then be harnessed at shop floor level in order to ensure that the organisation could grow to its full potential. The GK improvement programme had attempted to improve shop floor performance through sharing greater knowledge to each foreman by use of training materials and by access to the numerous B90 standards. Deming implied that this knowledge must be allowed to manifest itself for the wellbeing of the organisation. Van der Heijden (1997) supports this statement by saying that *competencies must belong to the firm as an institution and not exclusively to its members individually.* This implies the need to develop a suitable culture for improvement that can be shared across all levels and all functions within the global Nissan environment. This global drive was intended not just for knowledge sharing but to motivate for success. The B90 Engineering section office in Japan had developed an institutional knowledge base, which was created through people networking with each other in Japan and through the processes being embedded in their organisations. The factor that needs to be developed in South Africa is how can all members of the organisation accept and support the change process.

1.6 Conclusion

Chapter one has explained some of the background to the concerns in trying to implement a formal control system for productivity and quality improvement into an unstable situation. Various stages in the development of Nissan South

Africa have been discussed, as have the mental model changes of senior management. The background to the Japanese developed NPMS has been investigated and a conclusion drawn that it must be supported by all levels of the organisation if it is to be used successfully as an improvement tool. The differences in cultural, motivational and knowledge backgrounds both of production workers and senior management in South Africa compared to Japan have been highlighted. This difference in cultures and level of understanding of basic improvement tools could prevent this improvement tool being successfully introduced in South Africa. It has been proven by the Japanese through correlating performance results with the level of implementation of their formal Nissan Way method, that the NPMS is the preferred improvement framework for each overseas company in the Nissan family. Other approaches such as Management By Objectives without the supporting improvement processes have been rejected by the Japanese senior management. Some existence of a fear factor, mainly through insecurity, seems evident at all levels in the organisation and this must be eliminated, according to the teachings of Deming (1982), before the organisation can move towards achieving its goals. The new "hands on" approach of a Japanese executive now in a control, rather than an advisory capacity has been highlighted as one of the opportunities for driving out fear. It has been suggested that executive interface with all levels of the company by using the Top Sindan audit principle will accelerate the change process. The future approach of supervision to be successful in terms of quality and productivity has been highlighted, particularly the revised role of the foreman. The Nissan Plant Management System, with its supporting values, has been suggested as the possible tool to make this transition.

CHAPTER TWO

EVALUATION OF THE NPMS AS A GLOBAL IMPROVEMENT TOOL

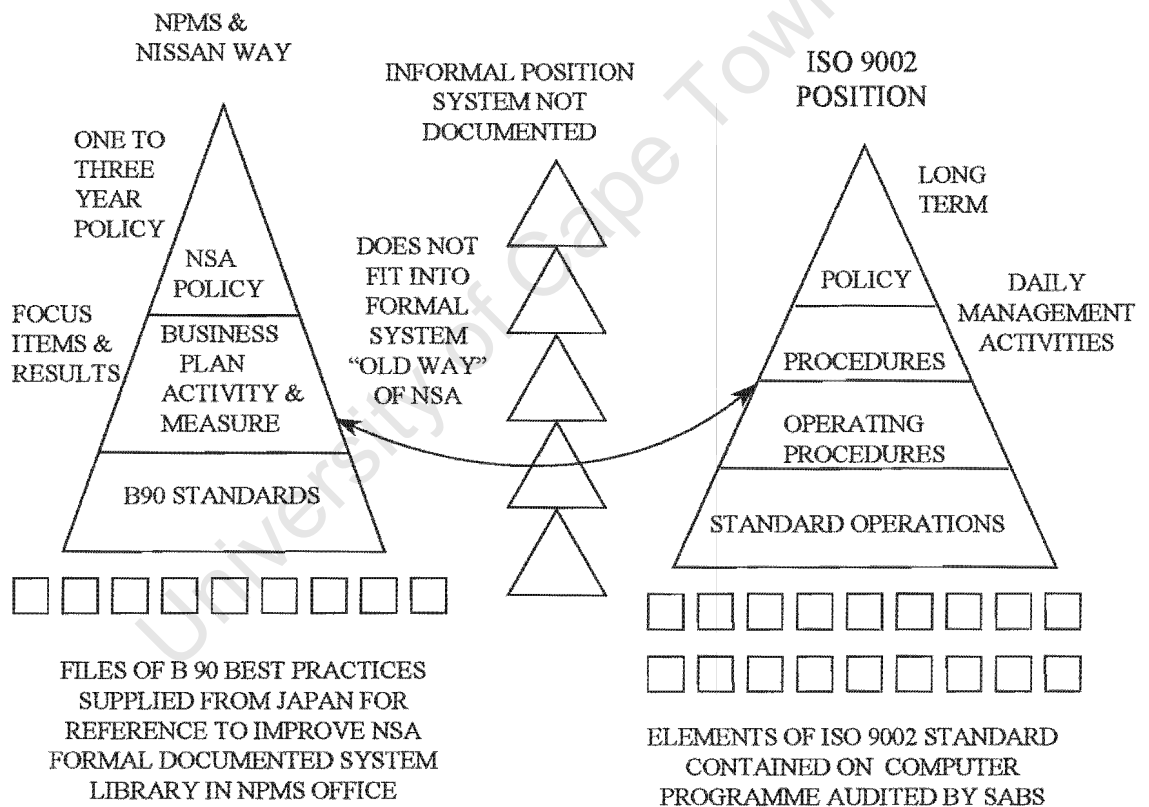
2.1 Introduction to the NPMS process

In Chapter One we described how NSA had looked at various improvement techniques and the limited success that had been achieved with the Nissan Plant Management System. The question had been asked, can a global system developed in Japan fit into the NSA environment? In this Chapter we will evaluate the NPMS as an effective global improvement tool. The NPMS philosophy was first introduced to NSA in 1994, initially to be used in achieving a standardised system approach and later as a tool for monitoring the overall Business Plan requirements set out by NML in terms of improving Quality, Delivery and Cost results. From 1996 the monitoring of the NPMS introduction process had been focused on reviewing the achievement of the various Key Performance Indicators (KPI's) against predicted targets. At the same time a step up score of between one and five as to the level of NPMS application being used was also measured, a score of one being entry level and five being master level. It had become clear over the 1998 /1999 NSA financial year period that the real driver of the NML executive was not solely the NPMS system step up score, to be clinically measured by Japan's appointed auditor of the System, but rather the Business Plan achievement result it led to. The true test for NSA was how the application of this system could achieve the goals and objectives set by each division in terms of the Company's bottom line result. Many management members, as well as other staff, were confused as to what was the true purpose of the NPMS and questioned if it was capable of achieving the purpose for which it had been introduced. Few if any of the senior management team had linked NPMS achievement to standardisation, although most of them had linked the NPMS to the achievement of the organisation's goals through the monthly monitoring of control item results.

2.2 Establishing a link between a standardised system and obtaining results

NSA had developed a standardised documented system to suit the requirements of the ISO9002 (1994) Quality Assurance Standard. A conceptual model of this Standard and how it links to the NPMS conceptual model is shown in Figure 2.1 Link between ISO 9002, NPMS and an informal system. The model shows that the previous informal system was not structured in terms of defined policies or activities that were interrelated.

Figure 2.1 Link between ISO 9002, NPMS and an Informal System.



It can be seen from the above Figure 2.1 that both formal models have policies which are supported by standards but the NPMS model has, in between its policy and standards a Business Plan activity and measure interface. The achievement of goals through target setting is very much dependent on the ability of the process

and how that process is managed, to achieve these targets. Wheeler (1993) says there are three ways to meet a goal.

- Improve the system
- Distort the system
- Distort the data

The processes used in implementing the NPMS in Japan are well embedded in the organisation as described in the eighteen hundred documented B90 Engineering department's Standards. These Standards were developed by top engineers in order to improve the overall system and were designed to interrelate with each other. Ackoff (1994) said "*The effect of any subset of parts on the system as a whole depends on the behaviour of at least one other subset*" Kauffman (1980) states that a system "*is a collection of parts which interact with each other to function as a whole.*" It is possible, therefore, that the system may well be distorted if subsets act independently. We also discussed in chapter one the fear factor that may be leading to the distortion of data. So the comments of Wheeler (1993) become very valid in the NSA situation where many subsets were acting independently.

2.2.1 Quality System Standard documentation

If we accept that standardisation is important to achieve quality and productivity objectives, then we must establish how much of the system needs to be documented. One of the functions of the Business Systems Support department at NSA is to ensure that the organisation adheres to a formal documented quality system, as prescribed in the ISO 9002 (1994) Quality Assurance Standard. This department also has to ensure that each functional area meets its goals and Business Plan targets as laid down in the NPMS. This has now created a need to balance the use of documentation between stifling change and promoting creativity, whilst still adhering to a system that can contain positive feedback. The Japanese approach to improvement is very much based on standardisation but this standardisation is continually challenged through Kaizen implementation. This is

This ISO 9001 (1994) Standardisation has in the past led to a stagnation of Quality Management Systems because of the lack of a specific clause requiring the continual improvement of the formal system. This situation was exacerbated because the main reason for introducing ISO 9001(1994) by many organisations was to stay on a customer's preferred supplier list, not to use it as an improvement tool, as also quoted by Dale (1994). This situation should be rectified with the proposed introduction in November 2000 of an updated ISO 9001 (2000) Standard for Quality Management that will require that ongoing improvement and Business Planning is in place, refer to Figure 2.2 ISO 9001 Year 2000 proposed update. This new version of ISO 9001 follows the Deming (1982) application of the Shewhart PDCA cycle and is an attempt by the International Organisation for Standardisation (ISO) to succumb to pressure from world groups to align the ISO 9001 (2000) Standard to suit market requirements. It can be seen from Figure 2.2 that the focus is on Customer Satisfaction, the same focus as that of the NPMS map described in Figure 1.1 section one.

2.2.2 The role of communication

If the introduction of standardisation and a common goal is to improve results then the content of these standards and the focused goal must be communicated to the entire workforce. It is also important to communicate with all levels and across all functions in the organisation if fear is to be eliminated and a constancy of purpose is to be created. Wickens (1987) cites six paragraphs from the Industrial Society's (UK) "Charter for People at Work" which are stated as follows:

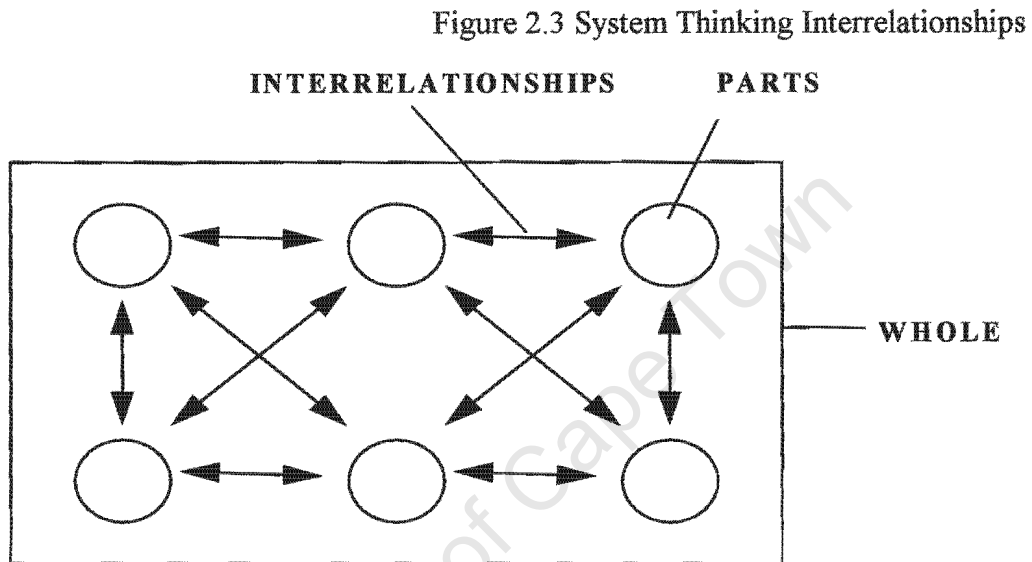
- The greatest challenge is co-operating with change – both technical and structural. All change must be supported by effective leadership from those accountable for involving people at every level.
- Views of people at work should be consistently sought and taken into account by management.
- To gain flexibility, commitment and the highest level of customer satisfaction and a sense of achievement we need to explain decisions and relevant business issues at regular intervals.

- We should take the lead in providing opportunities for individuals to contribute in the most appropriate way. Industry and commerce must in turn contribute to the community if it is to provide employment, resources and hope for the future.
- Individuals should be encouraged to participate fully in the activities of their trade union. Productive management – union relations should include the positive commitment from both parties to the aims and success of the enterprise and to the achievement of justice for the people involved.
- We should work to ensure that the whole community, especially the young, understands why the creation of wealth matters, both for future employment and for society as a whole.

Peter Wickens goes on to say that *'if such philosophical statements are to be true to themselves then the team should develop them.'* Another British Motor industry mogul Ray Horrocks ex-chairman and chief executive of British Leyland quoted in Wild (1982) says *"The perfect management structure would appear to be businesses run single-handedly and which by definition, involves unanimous decision-taking, instant communication and the shortest, most direct chain of accountability! However, most managers operate within structures of some complexity, but the concept of attempting to act as one person is worth pursuing. I identify three main areas of management technique where the 'speak, think and act as one-man approach' can greatly strengthen the corporate effort. These are Consistent and Predictable Decision-Making Processes; Dual and Effective Communication."* Horrocks goes on to say. *"It would be difficult to over estimate the power of effective communication – it's the weapon for winning the 'hearts and minds' of all of a company's audiences – shareholders, suppliers customers, managers and shop floor alike. Of these good internal communications throughout all areas of a business are vital."* The Japanese see this communication role as important and have created various forums to discuss and display results and communicate improvement activities. These communication forums take place from green areas at shop floor level to Operations meetings at senior executive level.

2.2.3 The NPMS interrelationships across divisions

Each division has an interrelationship in the system with all the others. This series of interrelationships is depicted in Figure 2.3 System Thinking Interrelationships, where it can be seen that each part interacts with other parts to contribute to the whole system.



The above Figure 2.3 shows a number of parts interacting with each other to form a whole system. In the case of Nissan South Africa these parts illustrate the departments or divisions or even various tasks, processes or business plan targets that cut across divisions. Ackoff R (1994) emphasises that individual parts when taken away from the whole have little or no substance. The NPMS attempts to bring these divisions together by bridging the three pillars of the organisation, that is design / development, production engineering and shop floor by team kaizen improvement as shown in Figure 1.1 The NPMS Map contained in section one.

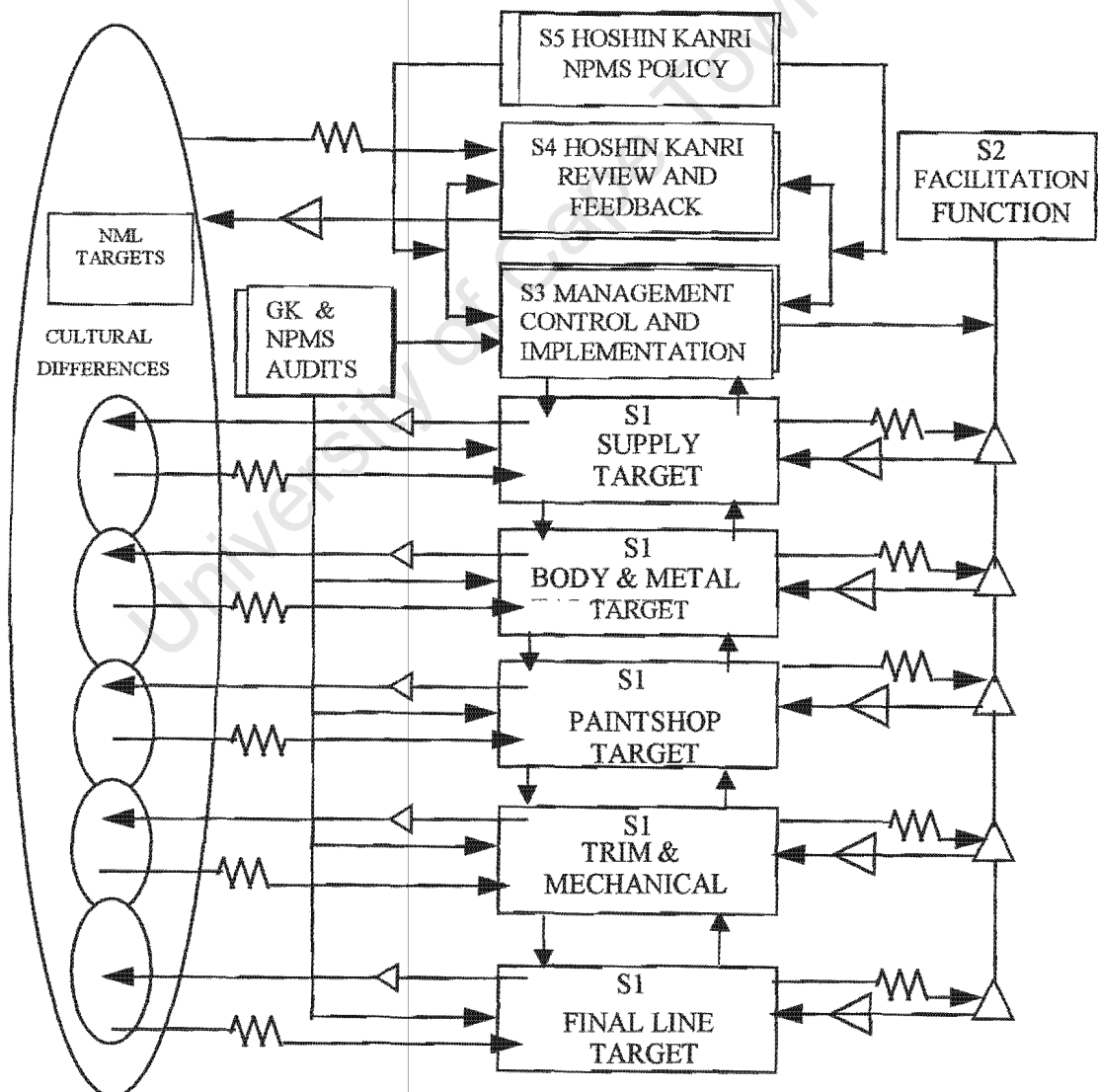
2.2.4 The NPMS and the Viable Systems Model

One of the main attributes of a Viable Systems Model (VSM) as described by Beer (1985) is its ability to deal with dynamic feedback and variety. The NPMS is very prescriptive in its nature both in implementation to a rigid methodology and its

support standards of proven best practices of the source company. It can be argued that by comprehensively documenting a management system, variety is reduced and is replaced by consistency. Kauffman (1985) states *"It is much simpler for a society to have one basic set of rules which apply to all families."* This could give justification to the NML head office promoting a Nissan world standard for quality and productivity improvement. So the challenge to the organisation is to satisfy the requirements of NPMS and maintain its viability in terms of Stafford Beer's VSM. Feedback loops from the numerous audits of the system are relatively slow and generally only occur following the discovery of non-achievement to the targets set on a static Business Plan or prescribed standard method. A VSM allows for greater complexity and variety to be dealt with in a far more dynamic manner. This can be taken further in terms of predicting outcomes based on external environment dynamics. This is mainly possible because of the nature of a VSM to be self-organising, as it is able to meet with dynamic external conditions. If a narrow view is taken of the Hoshin Kanri deployment method, then it only covers those elements of the manufacturing process that effect the "Business Plans" that have been established through the introduction of specific Control Items. As many elements of the broad NSA system, for example finance and marketing are not part of the scope of the NPMS, can we say that it considers the system as a whole? Also does it take into account the entire outside environment? If the outside environment is considered to relate to customer satisfaction only, then we can say yes. However, other factors such as increased competition from imported products leading to loss of market share would not be addressed within the scope of the NPMS, so we must conclude that it doesn't totally consider the outside environment. However, the debate is not whether the NPMS allows for system improvement, rather should that improvement be motivated by the Hoshin Kanri activity? It can also be asked what influence does the monitoring by the NPMS department and the EVP Top Sindan audit as an S3* function have on improvement or can this be motivated by normal S1 or S3 functions? The NPMS, is not in itself a complete system, but it does have a place in the context of a broader Viable Systems Model. However, the NPMS takes a broad view and not only looks at tasks and responsibilities, as for instance the ISO 9002 Standard

(1994) does, but also incorporates ongoing performance measurement. In the quest to ensure strong interrelationships between functions and hierarchies, there is a similarity between the NPMS and the VSM as discussed by Clemson (1984). Systems thinking and a subsequent approach to interrelationships have contributed to the development of the VSM. Figure 2.4 the VSM model within NSA, shows a number of parts interacting together to produce the whole in the context of Hoshin Kanri. The VSM structures these parts in a particular way and operates in an external environment and allows for feedback from that environment. This external environment now has to take cognisance of the Renault, Nissan Global alliance and the cultural challenges this presents.

Figure 2.4 VSM model within NSA relating to Hoshin Kanri



In figure 2.4 it has been illustrated that in the context of Hoshin Kanri policy deployment, each S1 level has its own activity relating to its own contribution towards the overall Company target. This does not mean that other activities, which can be described as daily management, are not taking place. The Hoshin Kanri activities are in fact being amplified to suit the requirements of management. Clemson (1984) acknowledges this and gives the example of management saying, *"This is what we want done. Please figure out how to do it and then do it"*. The daily management activities are being attenuated and basically left alone by management they are often only interested in what is contained in the Business Plan. In the case of NSA there is a strong external systems influence from NML in Japan. The aforementioned merger of Nissan and the Renault Company in France has further complicated this with an external financial influence. The financial targets being set by head office are impacting on cost saving through reduced headcount but the complexity of the operation remains the same. The NPMS also attempts to use its different parts in such a way as to handle the most complex and variable internal situations. A VSM of an effective organisation facilitates the process of control as well as communication between levels and across functions. The diagram in Figure 2.4 links systems thinking, as interpreted to the Japanese NPMS model, with an interpretation of a Viable Systems Model as described by Clemson (1984), Kauffman (1985) and Beer (1985). Figure 2.4 also shows the NPMS and GK audit and facilitation role with the interrelationships of each department. The concept of the customer is the next chain in the process is shown in the feedback loops of each S1 function. In this case the target of one function is linked directly or indirectly to the target of another function. The outflow of defects from one area to another e.g. body shop to paint shop is seen to be a focus of action by the Japanese. However, the focus is on a numerical figure to meet a benchmark rather than the actual process variation itself. The task of alignment of the system across functions by the managers themselves is seen as important by the Japanese EVP and by opening up channels of communication the defects generated can be greatly reduced. The NPMS department's audit is seen as secondary by the Japanese or even as an infringement of the duties of the S3 function. Their objective is that each manager

takes full responsibility for each aspect of his own department and should not rely on an external audit or facilitator to carry out this function. This role is now becoming more directional in line with that of an S4 function in terms of aligning policy and giving broad business direction. The S5 function is looking at the Hoshin Kanri policy of the organisation as required to satisfy the customer and use as a base to set the corporate business objectives. One of the S4 functions is that of the Business Plan review and the Executive Vice President is using his Top Sindan audit function to review performance on a personal basis. A Management review committee to oversee the adherence to ISO 9002 (1994) is still in place and this committee must verify that the quality management system as implemented and maintained is effective and is satisfying the policy, goals and objectives of the organisation. This S4 role is now shared with the Senior Manager of the Business Systems Support department who now also oversees and reports the Business Plan objective results for the entire company to the parent company in Japan. The S3 function is the control function, which ensures that standards and procedures are implemented and maintained as per the requirements of the Business Plan objectives. This function also has to update and report on a monthly basis Business Plan performance by each area manager to his Vice President. The S2 function has been limited to the facilitation function of ensuring that each activity is interacting to enable the overall company targets to be met. S1 shows the areas within NSA that are subject to shop floor improvement initiatives and feedback information on non-conformities to and from each other. Each area has its own goal set for QCD target achievement that is monitored daily and reported monthly.

2.2.5 The role of facilitation to create harmony

For the NPMS to be able to operate as an effective global management tool there must be a harmonious approach by all functions in NSA to achieving the objectives set by each function. The first true constitution of Japan, promulgated by Prince Shotoku Taishi in AD 604 stipulated that the principle of all societies and communities was “*wa*” (harmony). Wickens (1987) states that *The Japanese people tend to value group harmony more than individuality. Given the presence*

of this deep-rooted element in Japanese culture it is not surprising that group orientated ideas have been adopted in corporate management practices. A balance is therefore necessary in NSA to ensure that system changes brought about in order to cater for the dynamic needs of the individual must be tuned to the requirements of the customer and the broad needs of the system. Intelligence reports from each area are therefore essential and each activity must have some degree of control to ensure that the group benefits from individual activities. There is a current fear in the minds of senior NSA management that many of the current changes initiated through Japan, particularly with headcount reduction, are too radical. The Japanese, however, take a different view and look at the whole system and rely on the individual management to ensure a harmonious approach to headcount reduction. So facilitation must be extended to the way business is modified through changes to the system as well the achievement of new goals and targets as required in each Business Plan update set to improve the bottom line result. The Business Systems Support department has been assigned the role of ensuring that this facilitation takes place through GK and HK activities through all divisions and departments. Corrective and preventive actions can then be determined which can be implemented in such a way as to keep the goals and objectives of all the divisions viable and still meet the collective targets of the organisation as a whole.

2.2.6 The functional step up diagnosis method

The Japanese believe that there is a relationship between the various production and support systems within a manufacturing environment and the results obtained. The Relations Diagram shown in Figure 2.5 taken from an NML published NPMS Standard, illustrates this relationship. The white stars indicate that there is a relationship and the black stars indicate a strong relationship. This relations diagram can be used for any plant in any environment in the Nissan global family. Various parameters have been recognised which will influence the performance levels of each operation. These have been listed in the diagram shown in Figure 2.5 as volume level, kinds of models, degree of parts localisation and the wage

level of each country. Each function has a step up achievement level from one to five, one being no significant evidence that a control system exists and five being that a full system is in place and is entrenched in the organisation. A correlation has been established by the Japanese Engineering department to indicate that the higher the functional step up diagnosis score the better the expected performance results. An example of a step up check sheet for quality can be found in Appendix Two. Nine key performance functions have been recognised as essential to improving performance results. These are Policy management (HK), shop floor management (GK), labour control, inspection job, maintenance management, production control (logistics), productivity control, cost control and production engineering. The application of these functions to the desired level is seen to influence the following outcomes; OK VES results (shipping quality levels), OFF VES results (production quality levels), monthly production volume achievement, daily volume achievement (measured against daily required schedule), direct labour productivity (measured in units per man per month) and indirect labour productivity. These in turn are all influenced by the manufacturing environment in terms of volume level, kinds of model, parts localisation and the wage level prevailing in the country of manufacture.

Figure 2.4 the NPMS Matrix diagram (source NML Japan)

				OFF VES - S	★			★					★
★	★	★		OK VES - S	★	★		★	★				★
				Monthly volume achievement	★				★	★			★
		★		Daily volume achievement	★		★		★	★			
★	★		★	Direct labour productivity	★	★	★				★	★	★
★	★	★	★	Indirect labour productivity	★		★	★	★	★	★	★	
				QCD result Functional level Environment Diagnosis N-PMS step									
				Management plan	★								
★	★		★	Personnel & labour system		★	★						
				Production shop floor		★	★	★	★	★	★	★	★
★	★	★		Production engineering & staff	★						★	★	★

Key Performance Indicators (KPI's) monitor each of these measures and the results achieved are sent to the head office in Japan at the end of each month. The level of step up achievement is also measured through audit and evaluation and those results are also sent. By applying this relationship across all of the Nissan companies world-wide benchmarks can be established based on level of NPMS system introduction compared with actual performance indicators.

2.2.7 Comparing Benchmarks

Through a standardised approach of measurement and by using the principles of the NPMS step up method, each overseas plant can be measured and Benchmarks set up as 'best in class' by category. The senior manager of the B90 Engineering division at NML established the measurement of each Company by using the Standard NPMS step up diagnosis questionnaire. The Yulon Motors plant in Taiwan was promoted, by NML, as the Benchmark for NSA. This operation has a similar model mix and their volumes are also compatible with NSA. In October 1998 data was collected from each overseas plant and a comparison was made of the level of NPMS step up achievement scores and compiled into the matrix shown in Table 2.1. Benchmarks of NPMS Diagnosis results.

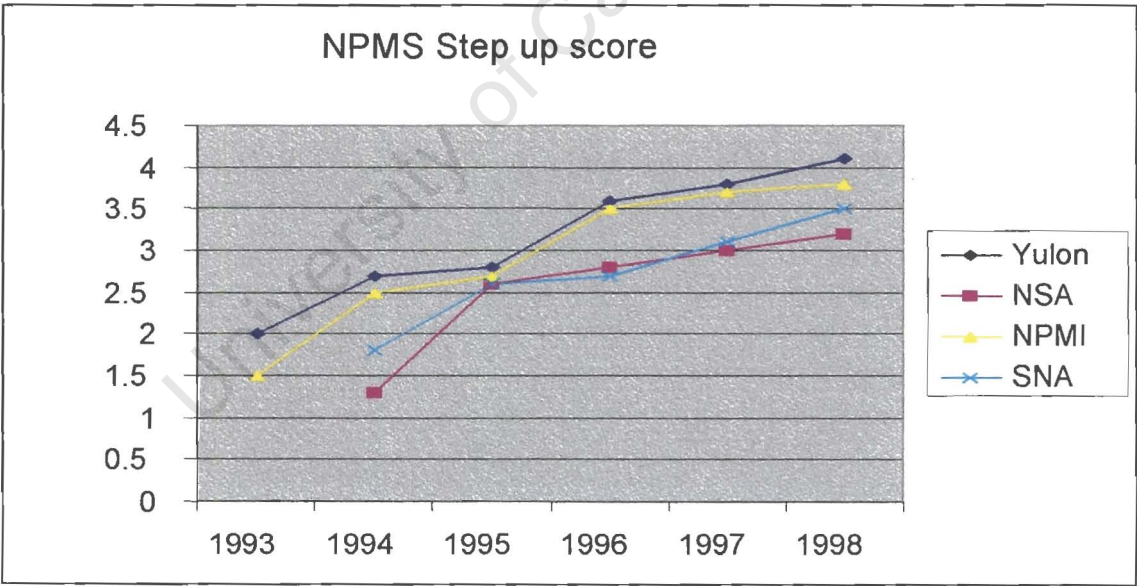
Table 2.1 Benchmarks of NPMS Diagnosis results

Function	NML	NSA	Yulon	SNA	NMPI
Policy management	3.8	2.5	3.5	3.8	3.5
Inspection job	4.9	4	4.8	3.8	3.5
GK	4.9	3	4	4	3.5
Maintenance control	4.7	2	3.7	3.4	2.5
Labour management	4.8	3	3.8	3.8	3
Process control	4.5	3.5	4	4.5	3.6

The above Table 2.1 shows a comparison of the levels of achievement of the NPMS functions by each overseas Nissan operation and each NPMS key activity.

As can be seen, NSA has a low level of achievement compared to the other operations. In this analysis a score of one is interpreted as basic and a score of five is interpreted as being fully competent. The world Benchmark is NML but Yulon Motors of Taiwan and SNA of Thailand are seen as being more representative for comparison to NSA. It can be seen that they have a much higher average score than NSA. The NPMS Matrix diagram in Figure 2.4 indicates the correlation of these functional step-up scores with actual performance of QCD objectives. Figure 2.5 NPMS introduction timing, shows the progress made by each of these overseas plants since 1993 and the step up score achieved. It can be seen that the Yulon plant in Taiwan and the NPMI plant in Malaysia started the programme a year before NSA. Using the Matrix in Figure 2.4 the step up results had good correlation with each plant's performance in terms of Quality and Delivery performance.

Figure 2.5 NPMS introduction timing



2.3 The Deming influence as the foundation for the NPMS

Harding (1999) recognised that the NPMS as a system links it to the Deming philosophy. Deming (1993) said *“the first step is clarification: everyone in the*

organisation must understand the aim of the system, and how to direct his efforts toward it.” This is covered in the NPMS by the Hoshin Kanri process of policy deployment. Deming goes on to say “*Everyone must understand the danger and loss to the whole organisation from a team that seeks to become a selfish, independent, profit centre.*” It is this Deming principle which is the main driver of the Hoshin Kanri element of the NPMS. We have discussed earlier in this chapter about creating harmony so all parts of the Company can focus towards a common goal. The Hoshin Kanri plan is the vehicle to be used to ensure this principle of harmonisation is applied. The new Executive Vice President of NSA has started this process of alignment of focus through his Top Sindan audits, which is not only checking the targeted result but also how each objective is supporting the overall Company’s targets.

2.3.1 The importance of Deming’s first and eighth point

Deming’s (1982) first point says: “*Create constancy of purpose for continual improvement of product and service.*”

Deming’s initial point calls for long-term thinking and planning by managers at all levels to promote a clear vision of the firm, its customers, its method for delivering value to its customers and the role of quality in that method. Managers must also ensure that employees understand this vision and move continuously toward it. The Nissan Plant Management System through the Hoshin Kanri policy deployment process as well as its call for clear indications of objectives and measures covers this, the first of Deming’s 14 points. This point also calls for harmony in that everyone must share the constancy of purpose across the organisation. Finally, this point calls for managers to focus attention sharply on long term efforts to reduce unnecessary variance in their Operations Management system. This reduction in variance is catered for in the call for the consistent application of the eighteen hundred B90 Standards based on Nissan world best practices. This point not only refers to the variance to the management system but all to the variety in the process.

Deming's eighth point is to *"Drive out fear."*

Deming identified fear as a major obstacle to improved efficiency and effectiveness and a major barrier to change and survival. Although Deming focused his ideology on the shop floor, the same fear can manifest itself in senior management as discussed in chapter one. Fear affects an Operations Management system in many ways. Some people are afraid to ask questions and reveal weaknesses in their knowledge; other people fear co-operating because it may lead to failure, such as poor performance reviews or even termination thus preventing some people from challenging current practices or trying new techniques. The foundation of the NPMS map states that it is essential to establish the suitable atmosphere, making the organisation energetic. This implies that fear must first be driven out. Finally, many people simply fear change because it forces them to deal with new and unfamiliar methods in place of known and comfortable, if inefficient, methods. The NPMS further requests that the organisation renovates the old stereotype to dispel these fears. All management does not share this ideology of Deming (1982). Wild (1982) quotes Hendrik Sloet the then Managing Director of Saambou National Building Society of South Africa as follows: *"To be a good manager one must be a strong manager. Thus he must have discipline and his staff must fear him to a degree. However, it must be fear that is inspired by respect and not the result of irrational or inconsiderate behaviour."* This idea of fear linked to respect seems to manifest itself in the Afrikaans management of NSA and it is interesting that this statement comes from an executive of an Afrikaans organisation. Deming's principles seem to be synonymous with the Japanese culture but are not necessarily easily accepted into the diverse South African environment. The Japanese management advisors at Nissan prefer to say that to drive out fear, managers must create an environment that encourages people to ask questions, report problems, and try new ideas through Kaizen improvement. Employees must know that the firm will not punish them if new ideas fail. Managers must demonstrate the importance of trying something new that offers a chance for a major leap in effectiveness rather than sticking with safe methods that offer only stable or declining benefits.

2.3.2 The need to focus on consistency

Although Deming (1982) refers to Constancy of Purpose, in terms of a single focused objective, it is important to the Japanese to be consistent. It is difficult to improve a process that is out of control, so therefore, any variation in a process needs to be controlled. The first objective is to focus on the consistency of the task being performed. The first step to meet this objective through the NPMS is to standardise the process through the development of procedures or work instructions. The degree of documentation developed is dependant on the nature of the task and the skill and experience of the person performing the task. This is why the Japanese spend a lot of time and effort evaluating the task as well as the skill level of the operator. At the higher level in the organisation consistency comes through the development of the Hoshin Kanri policy deployment activity. This methodology is aimed at being consistent in target setting and achievement, not just in the target set but in the overall effectiveness to the organisation. The NPMS prescribes a consistent approach to achieve quality and productivity improvements by utilising the various B90 Standards. Constancy of Purpose at NSA can be summarised as a focused approach by all levels in the company to bring the operating system under control by the application of the Standard Way of daily management. Once under control then Hoshin Kanri can be used to gain the improvements necessary to remain competitive. At shop floor level, once the operating system is under control, improvements can be made through Kaizen or gradual small improvements.

2.3.3 The need to drive out fear

Deming (1982) explained that *fear is an obstacle to improving efficiency and effectiveness. Neither an operator nor a senior executive will perform at their best if they are fearful of making a mistake or making a wrong decision.* If NSA is to adopt a new strategy for success, then fear of failure must be driven out. Senior management must not fear reprisal for reporting bad news. Shop floor workers must not fear disciplinary action against them for not performing to a standard that

they were not trained to achieve. A culture needs to be developed where everyone in the organisation can listen to each other and openly discuss concerns and collectively offer viable solutions. In order for this to happen sound personnel management principles must be adopted as prescribed in the NPMS map. A change of understanding about the meaning of discipline needs to take place. Discipline within the Deming philosophy refers to self-discipline of each individual to work consistently to a common objective through standard work methods.

2.3.4 How does Deming's remaining 12 points fit into the NPMS?

We will now look at Deming's remaining twelve points as adapted by Melnyk and Denzler (1996).

2. Adopt the new philosophy for economic stability.
3. Cease dependency on inspection to achieve quality.
4. End the practice of awarding business on price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training on the job.
7. Adopt and institute modern methods of supervision and leadership.
9. Break down barriers between departments and individuals.
10. Eliminate the use of slogans, posters, and exhortations.
11. Eliminate work standards and numerical quotas.
12. Remove barriers that rob the hourly worker of the right to pride in workmanship.
13. Institute a vigorous program of education and retraining.
14. Define top management's permanent commitment to ever-improving quality and productivity.

In essence all of W.E. Deming's points, according to Harding (1999), have been adopted for use within the framework of the NPMS with the exception of point ten. This point says avoid using posters and slogans. The Japanese parent Company at Nissan very much believes in the use of slogans. In support of the

NML Company they do use the slogans after providing resources to the operator to improve his performance. Deming (1982) was probably making the statement in this point that slogans alone will not improve performance. We can derive from this analysis that the NPMS is very much based on Deming principles as concluded by Harding (1999).

2.4 Deming's Theory of Knowledge as a support for the NPMS

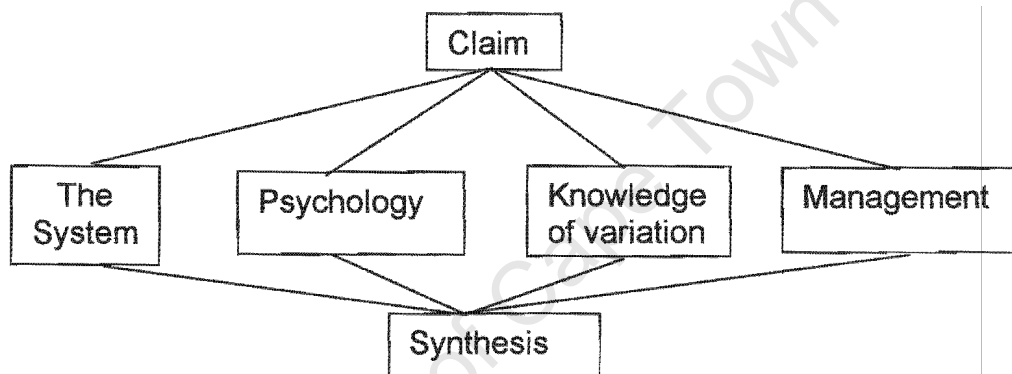
Dr. JR Goolsby, in an extract from his paper, published on the Internet at, <http://www.bluecrab.org.members/> describing Modern Management Philosophy, said, *"we know things because our senses inform us and we believe our senses. We observe things, measure things and witness things, and from our senses we "know". Nevertheless, the degree to which our experience is useful in "knowing" is determined exclusively by the structure that surrounds that experience."* Deming (1993) said that without theory there can be no learning. Goolsby interprets this as; that to be valuable our experiences must occur in a structured environment that is conducive to learning and is capable of putting meaning to our experience. The Nissan Plant Management System used as a productivity and quality improvement framework, gives just that structure to the entire vehicle manufacturing process and offers a broad learning opportunity through all levels. The eighteen hundred B90 Standards give the foundation to begin enhancing the learning process, but the actual Shopfloor gives the platform to put meaning to that experience. Deming (1993) said. *"The prevailing style of management must undergo transformation. A system can not understand itself. The transformation requires a view from outside."* This was a view that Deming referred to as a System of Profound Knowledge. This provided a map of theory by which to understand the organisation that we work in. The Standards created by the Japanese for use by all levels in a vehicle assembly plant also offer the opportunity for an enhanced knowledge to each individual. The first step then is to transform the individual. The individual transformed will perceive new meaning to his life, to events, to numbers and to interactions between people.

2.4.1 Introduction to Deming's system of Profound Knowledge

Deming listed four parts to the layout of Profound Knowledge and indicated that they all related to each other. This layout will be used to test the NPMS relationship with each of these following attributes.

- Appreciation for a system
- Knowledge about variation
- Theory of Knowledge
- Psychology

Figure 2.6 Deming's system of Profound Knowledge.



2.4.2 Transformation of management's appreciation for a system

Deming (1993) stated that the prevailing style of management must undergo transformation and that a system cannot understand itself. This transformation of management was necessary in order for the NPMS to work effectively in NSA. The previous management of NSA were only reporting the good news at executive operations meetings. As Deming (1993) stated in the New Economics *"An individual may seek to cast a halo around himself," reporting to the MD what the MD wants to hear.* Management needs to understand the broad principles of the NPMS. They could not report that the system was working well and in place if the data being reported indicated something different. Each manager needed know to whether his function was operating effectively within the broad system requirements of the NPMS. This understanding needed to be established through

the NPMS step up diagnosis that had been predetermined by the Japanese. The diagnosis score was an easy reference for each manager to know how he was doing as part of the broad system. The diagnosis method had been set up to balance the system. If the results of the system were on track, then the performance results should also be on track. If the two results did not balance in terms of performance results than some self-analysis was necessary.

2.4.3 Educating the shop floor on appreciation of a system

The NPMS can also be interpreted as an organisational learning tool towards the appreciation of a system, in that it encourages the participation at all levels in developing sound working interrelated practices. These practices can then be taught to various levels and functions. This can then be used as the foundation of future plans for further system development. Van der Heijden (1997) refers to a traditional “common sense” approach to an operational system and lists the following bullet points: -

- * An acknowledgement of aims, either through an external mandate or the organismic purpose of survival and development.
- * Assessment of the organisation’s characteristics, including its capability to change.
- * Assessment of the environment, current and future.
- * Assessment of the fit between the two.
- * Development of policies and, following from this, decisions and actions to improve the fit.

At shop floor level this is difficult to understand. To the operator his system is usually limited to his immediate task that he is performing in line with his Standard Operation Sheet. In some cases at NSA an operator would have been performing the same task for twenty years without knowing what was happening up or down stream. So it is difficult to enable the operator to appreciate a system. By multi-skilling an operator through the provision of on the job and off the job

training and introducing basic maintenance tasks, NSA are attempting to broaden the operators appreciation for the broader system. At foreman level this is taken much further through the training to the six basic training modules referred to in Section 1.3.4 and discussed later in Section 2.4.7. The idea of this broad training is to allow the foreman to move from pure supervisor to mentor and coach and also improve the operator's awareness of the broader system. Just as the operator has little knowledge of the broader environment in which he works, management also have little knowledge of the total environment of each operator. If management do not understand the total process they cannot understand the variation emanating from that process.

2.4.4 Enhancing management's knowledge of variation

In order for management to appreciate shop floor conditions, it is important that they are aware of the variation in any process and what those root causes of variation are. Wheeler (1993) states *"We live in the information age and much of that information comes to us in the form of numbers... Unfortunately, much of the data reported to executives today are aggregated and summed over so many different operating units and processes that they cannot be said to have any context except a historical one – they were all collected during the same period."* He goes on to say. *"Before information can be useful it must be analysed, interpreted and assimilated."* Deming's (1982) fifth point says, *"we must improve constantly and forever the system of production and service"*. But before the system can be improved, management must first understand that system, so that the necessary improvements can be made. The increased level of shop floor surveillance that the EVP and support executive were conducting was showing management the daily variation, through various control charts of how the daily data was varying in terms of the QCD performance. In this instance the EVP was not just taking on the role of an S3* auditor but also as an S2 support, according to Beer's (1985) VSM. It is important to note that management needs to be aware of variation but it is not possible for them to handle all of it without filters and amplifiers being used where necessary.

2.4.5 Empowering the operator and increasing his knowledge

Deming (1982) focused his twelfth and thirteenth point on removing barriers that rob the hourly worker of the right to pride in workmanship and instituting a vigorous programme of education and training. In order for the hourly worker to have pride in his work, he must be empowered to perform to the best of his ability. Sometimes this will necessitate that he is given the responsibility and authority to improve his own job through his own understanding of the process. The operator has the specialised knowledge of the day to day operation and management often ignores this knowledge. This knowledge must be utilised in terms of involving the operator when introducing new facilities or work methods. It is the task of management, therefore, to ensure that the operator is educated and trained not only in the skills of his direct task but in the broad environment in which the task is performed.

2.4.6 The green area challenge and psychology

A “Green Area” is a location where a unit of workers meets each morning prior to the start of shift under the leadership of the area foreman. This is part of the Genba Kanri system and is used in Japan for communicating performance expectations and assessing the previous day’s performance. To the Japanese culture this is quite acceptable with each worker having respect for his supervisor. In South Africa there is a psychological barrier to be overcome before this practice is fully implemented. The foreman is still seen by the operator as a voice of management to exert pressure on the workforce to meet management’s objectives. The NSA workforce does not yet accept the voluntary methodology of C and J (challenge and practice). Management’s challenge in the future must be to embrace this concept of giving ownership of improvement to each operator and allow him to meet his own target. The Green area is not yet seen as the communication forum where operator and Foreman exchange ideas and challenge the targets for improvement.

2.5 CONCLUSION

When evaluating the NPMS as a global improvement tool The Nissan Plant Management System appears to be a sound framework for introducing quality and productivity improvement with a focus on waste elimination and customer satisfaction. The basis for the system appears to be twofold. Firstly it relies on a standardised approach and discipline must be in place to consistently work to those standards, which form the basis of the system. The system is very prescriptive in its methods and application criteria and is far more comprehensive than the basic requirements of the ISO 9001 (1994) version of a Quality Management Standard. The new Draft International Standard updated year 2000 version of ISO 9001 has acknowledged that a broader view must be taken of a Management system by adding a Business Planning and improvement clause and by doing this has moved it closer to the NPMS requirements. Secondly the Nissan Way demands that the organisation cover all the human resource and softer issues that Wickens (1987) says must be in place prior to introducing a Japanese philosophy. This aspect of the NSA operation needs to receive much more attention if it is to compete on an International basis. The NPMS supports most of the principles of WE Deming (1982) described in his work "Out of the Crisis". In fact, Harding (1999) concluded that the NPMS had its origins from Deming's teachings. It also strongly relies on a motivated and knowledgeable workforce that are prepared to work in a disciplined and harmonious manner. The control of the system must come from the foreman who is able to play a leadership role in ensuring that management's targets are met through the principle of Challenge and Practice and at the same time ensure that the workforce are *willingly* working towards improvement goals. If the NPMS is used in its complete form, incorporating the application all of the relevant standards, it can be used for achieving the bottom line result. The degree of implementation must be through all levels to at least step up level four, as determined by the Japanese diagnosis method. It is imperative that the foundations of sound personnel management principles, which drive out fear from the organisation are laid prior to more

demanding pressure being exerted on the workforce and management for improvement.

The merits of using the NPMS in Nissan plants world-wide have been indicated by the fact that it is a proven system that has worked well for Nissan operations in Japan, Europe and North America where productivity levels have achieved results three times that of South Africa. (Source, Nissan Global Report) There is no guarantee that the system will have the same result if used in South Africa. The advantage of the system is that it is supported by many best practices that have been proven to work in Japan. The matrix diagram shown in Figure 2.4 also shows that there is a correlation between the level of NPMS application and Quality and Productivity results expected from the organisation applying it. The demerits of the NPMS are that it relies heavily on the self-discipline of each function to work to a standardised method. Nissan South Africa has not yet been able to demonstrate that it can achieve a level of four points, which is the implementation standard as required by the system administrators from Japan as explained in section 2.2.6. The key to the introduction process is the level of acceptance at the shop floor that is measured by Genba Kanri step up achievement. The Benchmark shown in Table 2.1 indicates that South Africa has the lowest score of GK introduction when compared to other overseas Nissan plants. Chapter three will now focus on the current situation at NSA and produce a problem statement as to why the system was not implemented to senior management's satisfaction. An action learning cycle will then be implemented to see how NSA handled the challenge of improving to the level of competence required by the parent company in Japan.

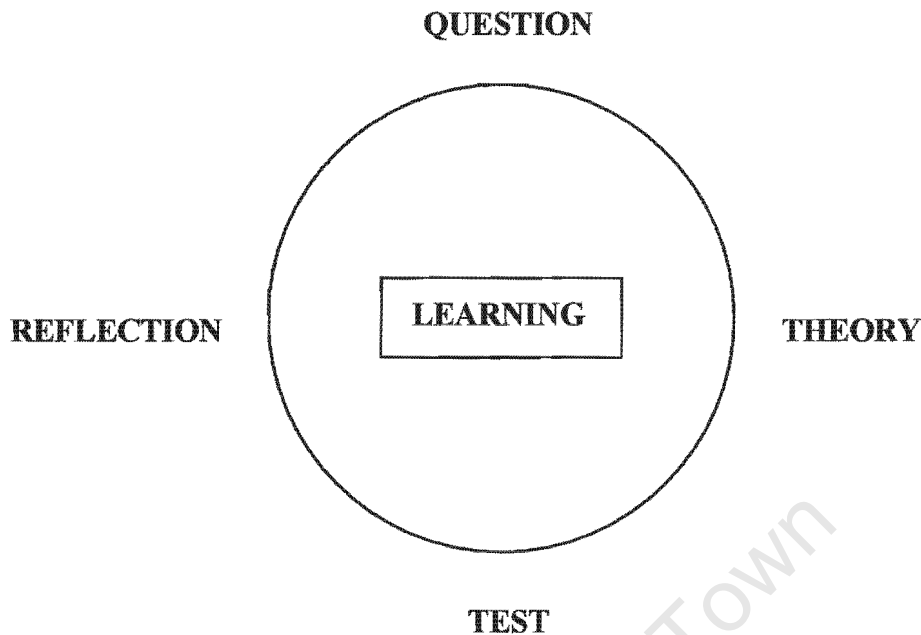
CHAPTER THREE

PROBLEM FORMULATION AND THE FIRST CYCLE OF ACTION LEARNING

3.1 Developing the problem statement

We have discussed what the purpose of the Nissan Way is in Chapter one and how the NPMS can be used as an implementation tool in Chapter two. A theoretical review has been made and this system has been compared to the philosophy of Edwards Deming (1982), the requirements of the ISO 9001 (1994) and ISO 9001 (2000) Quality Management Standard requirement and also Stafford Beer's VSM. The importance of consistently using standard documents as a base for improvement has been discussed and also the role of communication in disseminating the content of these documents. A view has been taken of the cultural values of South Africans compared to the Japanese. The level of acceptance that South Africans may have to Japanese systems within the various groups at NSA has also been highlighted. It has been suggested in chapter two that a climate of fear may exist in the organisation that prevents the NPMS from being fully embraced at all levels in the operation. It can be pre-proposed that Nissan South Africa has at its disposal a framework for developing a quality and productivity improvement programme. Despite having this improvement framework at its disposal, NSA had failed at the end of the 1998/1999 Fiscal year to meet its projected targets as shown in Table 3.1. In order to understand what NSA needs to do to emerge from its current position as a minor local player to a global player in the Nissan world, a Problem Statement will be developed to establish what action is required to change the focus of the organisation. Handy's (1989) Spiral of Learning, shown in figure 3.1, will be used to generate the initial enquiry into why NSA has been unable to focus on constancy of purpose and be motivated to meet its targets for Quality, Cost and Delivery as set out in the Business Plan.

Figure 3.1 Spiral of learning



Handy (1989) had commented *the wheel starts with a question, a dilemma to be resolved, a challenge to meet. If it doesn't start there, and if it is not our question, we shall not push the wheel around to the stage of reflection.*

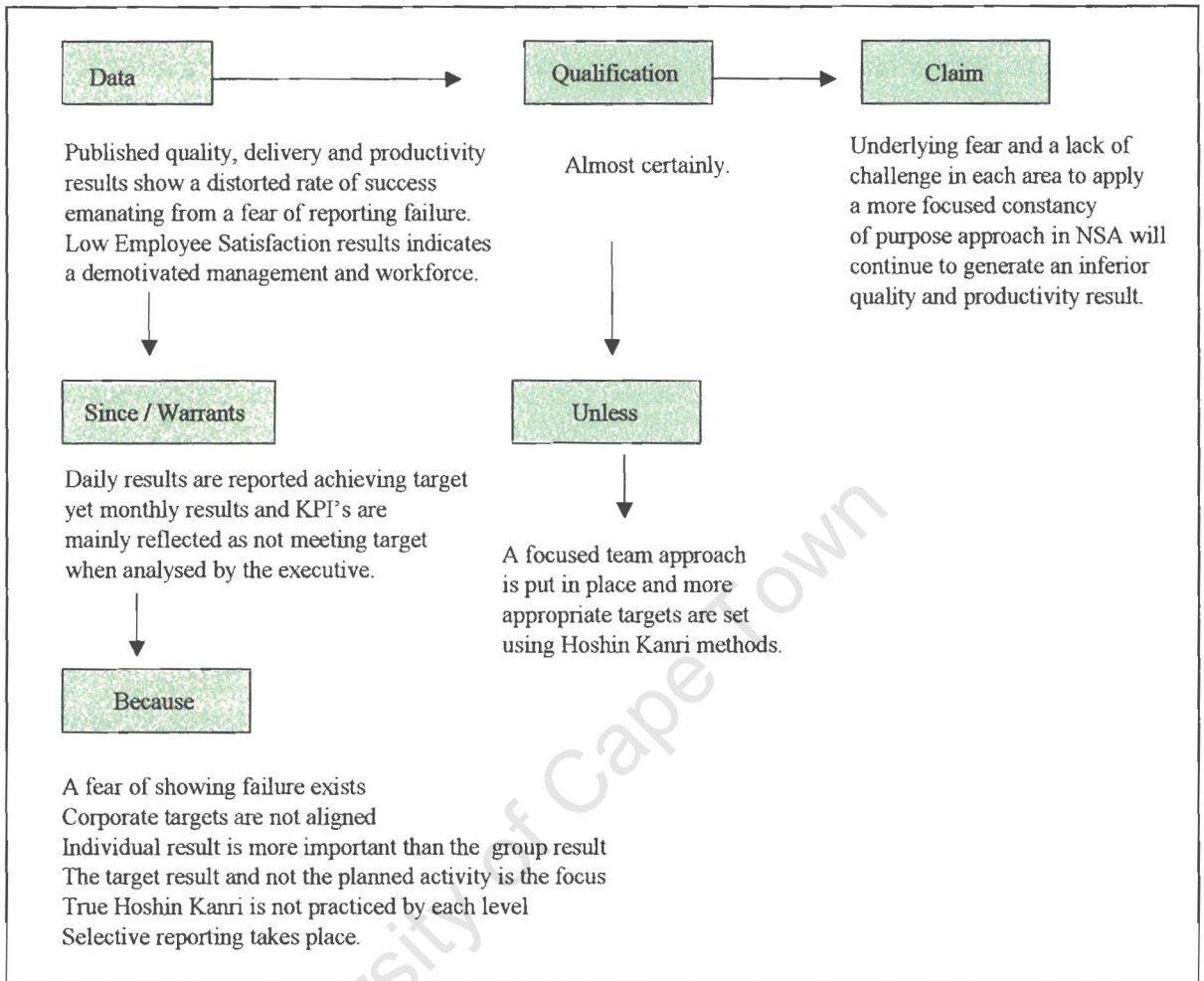
This spiral of learning will be used in trying to substantiate the problem claim emanating from a problem statement that has emerged from the discussion in the first two chapters. It is envisaged that a number of cycles of Handy's wheel will have to be used before a sound answer is forthcoming. We will start the process by questioning how effectively NSA applied the Hoshin Kanri activity at the beginning of the financial year in 1997. Investigation carried out in the report, submitted to UCT by Harding (1999), showed that NSA had not been able to effectively utilise this framework for improvement due to various constraints within the organisation, mainly cultural as described by Mentz (1997). Harding (1999) also concluded that not enough attention had been given to the people issues at NSA in developing and implementing its business plan. The morale survey conducted by the Human Resource Department had set a target of 40% motivation on a scale of 100. This modest target had not been met at the end of the 1998/1999 period. There had also been a lack of consistency in reaching the quality targets set in the MD's Business Plan. The Japanese auditor who has the responsibility for ensuring that the NPMS is successfully introduced into each

Nissan Plant concluded in March 1998 that NSA had not yet reached a level of System maturity where they could implement the NPMS without support from Japan. From these discussions a problem statement has been formulated as follows.

“Nissan South Africa do not currently have a motivated workforce that embrace the concept of voluntary continuous improvement. Despite using the Hoshin Kanri process for four years they still lack the constancy of purpose to focus on the real issue of satisfying both the internal and external customer in terms of quality, cost and delivery. This problem is manifested by a climate of fear in the organisation in which the targeted result of the business plan is seen as the main driver, irrespective of the process conditions and built in variability to the system. A further lack of consistency in daily activities in which resources are not being used in an effective and profitable manner and in which waste is not eliminated and productivity is not in line with world class standards exacerbates the situation.”

Before this problem statement can be accepted it must first be assessed in terms of the validity of this claim. Figure 2.3 Problem formulation claim breaks down the statement into constituent parts. Throughout this first cycle of learning, the problem claim statement as shown in the Figure 3.2 will be questioned against the theoretical implementation of the NPMS using Handy's (1989) cycle of learning. Questions will be asked, theories will be tested and reflections will take place on the effectiveness of each learning cycle. The question starts with the problem statement. This claims that the published quality, delivery and productivity data show a distorted rate of success. Published results will be shown to support this claim in terms of business plan results published by individual departments that do not correlate with the overall achievement results of the organisation as a whole. It has been suggested that this is due to a factor of fear as described in the work of W E Deming (1982) this argument will be pursued throughout this work. The importance of the targeted result rather than pursuing the methodology that will achieve the result will also be addressed.

Figure 3.2 Problem formulation claim



3.2 The problem formulation claim

The author suggests that a climate of fear and a lack of challenge exist in the organisation and that data presented to executive management are being distorted in order to hide the true situation of low achievement. This claim is supported by the Japanese head office who have indicated that our foremen and management cannot challenge the Productivity and Quality targets set in the Company's Business Plan. We need to investigate this data and come to a conclusion as to whether this claim is true. In the Japanese plants the concept of Chosen and Jissen (C&J) or challenge and practice is very much part of the continuous improvement process as was discussed in section 1.1.5. Each member of supervision at NML

can offer a C&J challenge to management to improve any item of quality or productivity. The theory behind this approach is that there is a motivation to succeed by the person, and his immediate superior, who is involved with the implementation process. This system has not been fully embraced at NSA and there is a tendency to dictate targets from above instead of accepting challenges from below. Callaghan (1998) quoted from an interview with a NSA employee; *'We will still have a year of top down decision making. It is very difficult to have bottom up decision making when the direction is not clear.'* The challenge at NSA is to change the top down approach to a bottom up approach, through the application of constancy of purpose throughout the organisation. The climate of fear must then be eliminated and replaced with a climate of challenge.

3.2.1 The review of control items to verify the data

The overall objectives and control items set by the Managing Director and reviewed at the end of June 1999 showed that most Objectives were not achieved. Table 3.1 Managing Director's Review Matrix 1998/1999, show that only the achievement ratio of the Shoshin (New Model introduction process) item achieved the target consistently as indicated by the green dot, in each of the twelve months. Investigation on this item revealed that regular meetings had taken place to discuss new model introduction. The ratio being reported to the executive was that meetings had been scheduled and that the meetings took place, so therefore the target had been met. There was no reference to an actual tangible result on how effective the new model introduction had been in terms of Quality, Delivery or Cost. On the other hand, the main measure of Quality had been set at achieving a Product Satisfaction Index (PSI) result. At no time in the twelve-month period did this item achieve the target of less than 110 Things Gone Wrong (TGW) per 100 vehicles. Other quality targets had been set which could be controlled by internal measures. This method of setting targets was suspect in terms that the company could measure the result based on its own criteria, whereas the PSI result was totally an independent and more realistic measure of true competitive achievement.

Table 3.1 Review of Managing Directors Business Plan 1998/1999

REVIEW MATRIX - 1998/99 BUSINESS PLAN**POSITION : Managing Director****AREA : MANUFACTURING**

Obj./Control Item	1998/99												Target value
	7	8	9	10	11	12	1	2	3	4	5	6	
Quality: PSI Value TGW/100	●	●	●	●	●	●	●	●	●	●	●	●	110 0.35
Initial 3month warranty ratio	●	●	●	●	●	●	●	●	●	●	●	●	
Cost: Into stock Vehicle manufacturing cost	●	●	●	●	●	●	●	●	●	●	●	●	Rand
Divisional total expense	●	●	●	●	●	●	●	●	●	●	●	●	15% reduct
Delivery: Monthly into stock schedule	●	●	●	●	●	●	●	●	●	●	●	●	98%
Effective value stock reduction	●	●	●	●	●	●	●	●	●	●	●	●	Rand
Achievement ratio Soshin control	●	●	●	●	●	●	●	●	●	●	●	●	100%
People : Implement NPMS	●	●	●	●	●	●	●	●	●	●	●	●	Step up 4
GK Menu	●	●	●	●	●	●	●	●	●	●	●	●	50 Audits

Meets target



Within 10%



<90% of target



Supporting the PSI quality result, a measure had been taken indicating warranty claims in the form of a target of 0.35 defects per unit in the field, within 3 months after delivery. Both of these quality results indicated that the quality related performance against target had consistently failed for the twelve-month period in question. A third item, which was related to both delivery and cost, was the effective value of stock reduction. This target saving of Rand value in reduced

inventory had also not been achieved. Overhead expenditure during this period had been greatly reduced which was reflected in the target of reduced divisional expense by 15%. This target had been reported as being on track right up to the last month of the financial year although in the final month the target was not met. Under the delivery heading, the core business of the company in terms of delivering assembled vehicles was not effective in that on only one occasion was the target of 99% delivery against schedule achieved. The data in terms of results achieved, emanating from each Director's Business Plan for the year 1998 / 1999 was submitted to the NPMS office in July 1999 to be reviewed in order to clarify the QCD performance results. From this data it would be possible to establish if the targets set were appropriate or not to the overall business performance. Each target should be supported by a control item, which would signify the methodology used. This analysis activity was broken down into the following five diagnosis steps:

1. Check the actual result obtained against target for each methodology by director and division.
2. Confirm the contribution to each division by examining the impact the result had on the objectives declared by the division.
3. Confirm the interrelationship of each target and control item activity with other division's targets.
4. Confirm the impact of each objective on the overall company performance.
5. Repeat this process for each level of management in each division.

In order to verify that the Hoshin Kanri process was giving the correct result, it was first necessary to check if the Hoshin Kanri system was being applied correctly. To this end the above diagnosis method was used and applied to each division. Each division's results were then analysed against the overall objectives of the company. In this first cycle of learning the methods used to verify the effectiveness of the Hoshin Kanri process were very mechanistic in terms of the forms and review methodology used, rather than focusing on the appropriateness of the target itself.

3.2.2 Checking the actual result obtained against each target

This section will focus on the quality objectives as set out in the NSA Managing Director's Business Plan review matrix 1998/1999 as shown in Table 3.1. As was previously indicated, the quality objectives of the company were not met at the level of the Managing Director. The Business Plan at the level of General Manager of Quality Assurance was analysed and it was found that his control item targets on the subject of Initial three-month warranty were met, refer Appendix 3. These control items were set to improve the top six quality concern defects. The target set was to achieve a better than 80% solution ratio to each concern by each month and this target, according to business plan results, was met. Even though 87% of concerns were successfully addressed according to the plan, the company target of less than 0.35 defects per vehicle on warranty was not met. This situation left some doubts about the suitability of the control item chosen to support the objective. Analysis of the Business Plan of the Quality Systems co-ordinator was also analysed and it was found that both quality categories were also met refer Appendix 4. The targets set were to improve the Quality system by updates to one hundred and twenty procedures and also to reduce the system audit findings of non-conformance from the South African Bureau of Standards to the ISO 9002 (1994) Quality Management Standard. By June 1999 it was reported that one hundred and twenty three documented system reviews had been completed for relevance to Customer Satisfaction, thus meeting the target. The ISO 9002 (1994) audit findings from the SABS were recorded at eleven, which was less than half of the target set, but in reality this had little impact on the real achievement of quality in terms of Customer Satisfaction. The performances against target of the Engineering Director's Business Plan refer Appendix 5 was then checked. In contrast to the other plans, it was found that this plan had identified the real need to focus on genuine quality concerns. The main focus was to reduce, by a corrective action programme, the top three defects causing quality problems by 50% per model. This was a far more realistic target in terms of matching the overall company objective. The target was not met but it highlighted a deficiency in the system that could receive more focus and corrective action. The

Engineering Director's control item was focused on deleting variation. The supporting activity for reducing the top three defects by fifty percent was based on deleting variation from the process. This was to be achieved as follows:

1. Taking ownership of the dynamic quality evaluation "VES D."
2. Entering into a business plan commitment.
3. Creating action / activity plans for the top three concerns.
4. Riding in every vehicle with the VES D auditor.
5. Finding the real cause of every demerit through detailed analysis.
6. Providing both temporary and permanent countermeasures to the concern.
7. Facilitating a daily feedback meeting with Engineering, Production and Quality Assurance.
8. Daily monitoring and correlation of each concern to road test rejects.

A very experienced Japanese engineer had created this particular Business Plan and in conjunction with his engineering team had selected a difficult but an appropriate task to be completed. He had also shown that it is not advisable to 'chase' lots of activities but rather concentrate on one or two important ones and create an actual activity plan to achieve them. This plan had also allowed a bottom up approach with each engineer choosing his improvement subject.

3.2.3 Examining the impact of each result

If the impact on the overall objectives to the company of each of the quality control items highlighted in the previous paragraph is examined, it will be found that only the engineer's item had real impact, even though the result showed failure to the target. The General Manager of QA had set what appeared to be a relevant target in terms of a solution ratio to defined quality concerns. The main concern with this target setting, however, was that the solution ratio was very intangible. True scientific method had not been used to produce a lasting solution. The other control items of the System Support group were spurious to the real objective of attaining Customer Satisfaction. The fact that the SABS auditors

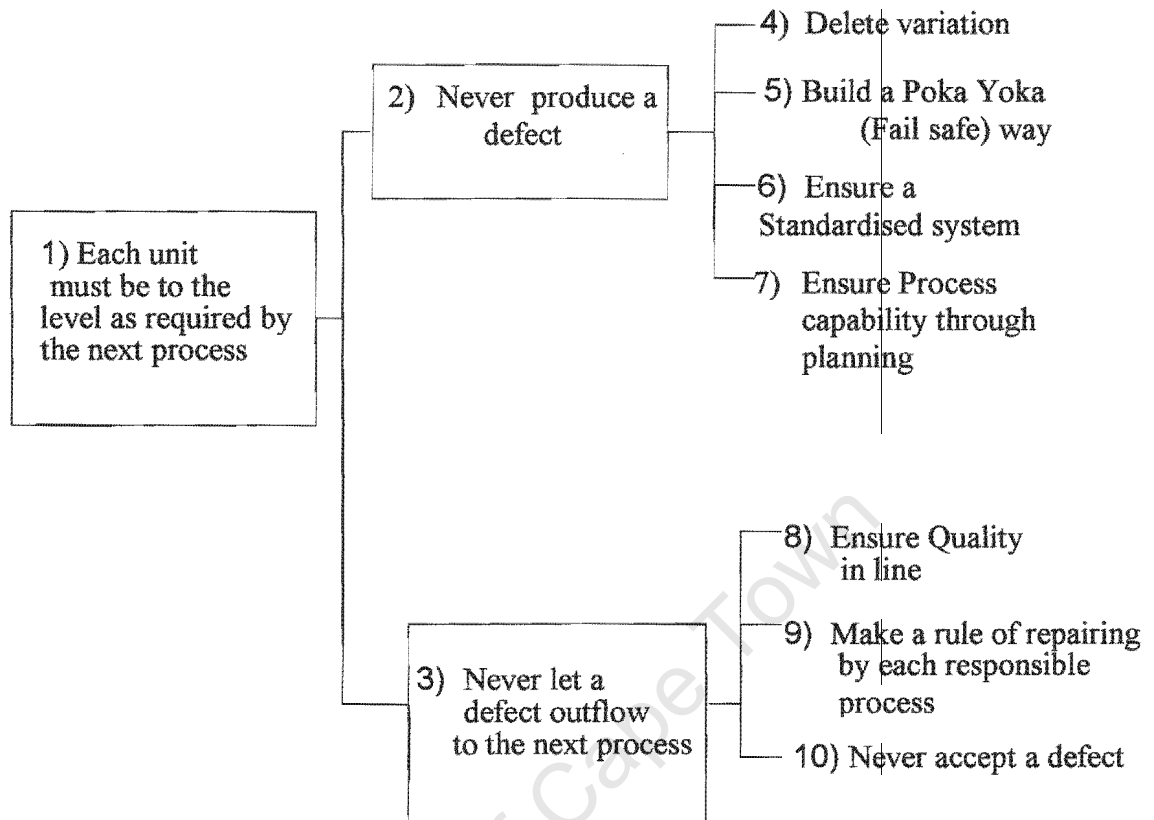
recorded only eleven system findings could not be proven whether it was a result of a good system or an inadequate audit. In fact the auditors qualified their report by recording that 'because findings are not recorded it does not mean that none exist.' This is standard practice for all ISO auditors. The other item of the System Support group, which was the review of the documented system for improvement, was also on the surface a valid measurement. The problem with this target was that it tried to cover the whole system instead of focusing on a relevant part, to give maximum impact, as had been achieved by the Japanese Engineering Director.

3.2.4 Confirming the interrelationships of each target

It was normal practice at NSA for each target to be set on each division's business plan by the individual divisional head focusing on his own function. As was discussed in section 2.2.5, there is a need to create harmony in the organisation to focus on a common goal. The NPMS itself has an interrelationship across divisions in its structure, as discussed in section 2.2.3, and this interrelation needs to carry over through the application and development of Business Plans and objectives through the Hoshin Kanri process. It is necessary to examine each of the quality targets and control items discussed in the previous paragraphs to confirm whether each of these were interrelated to the overall quality objective or not. We will start by examining the development and improvement of the documented quality system improvement for Customer Satisfaction. We have said in earlier sections that the foundation of the NPMS is Standardisation, so it is logical that we start any improvement activity with the improvement of the standard. This activity should support our goal of applying Deming's (1982) principle of *'creating constancy of purpose for continual improvement of product and service'*. So this item on the surface appears to be valid for improvement of Customer Satisfaction. What is questionable is that one hundred and twenty reviews of each procedure was not focused enough to give a meaningful result. If we look at each target focused on quality from each of the three divisions then a better control item may have been to improve the procedure for applying

corrective actions. This could then have been related to the QA target of improving the top six concern items through the introduction of a meaningful corrective action process. The Engineering Director could have also contributed to this target by giving advice on how to improve the procedure for applying corrective and preventive actions to achieve maximum result. This isolated way of developing targets appears to be part of a pattern in NSA that had developed that enabled managers to declare general improvement topics without having to focus on specific improvements that could easily be challenged. This may have been prompted by a fear of failure, leading to reprimand, to reach a difficult target as discussed by Deming (1982). If we investigate further the Shosin result declared in the Managing Director's review matrix in Table 3.1 we also find that it was a generalised approach and not focused on a specific measurement. There could have been a good interrelationship of this item with the other three if the focus had been more on providing a capable process for known previous concerns, when a new product is built at the production and the engineering trial stage. Following the preliminary analysis of the control items developed for quality improvement, a tree diagram was drawn up to highlight the flow of activity in order not to allow defective parts to be passed on to the Customer. Each department was then able to produce a more meaningful target and control item that supported the overall quality objective. The NPMS department was then at the same time able to promote interrelationships across each division. This is shown in Figure 3.3 Quality improvement tree diagram. If this tree diagram is studied more closely, it can be seen that opportunity exists across divisions for focusing on more appropriate activities and targets. Items one, two and three, shown in the tree, are very generic statements and relate to an actual improvement target that can be measured in terms of defects produced and outflowing to the next process. Items four to ten have now broken down these statements into more tangible objectives that can be easily measured as control items. These items can then be expanded into tangible activities with appropriate targets that relate to the overall objectives for quality. This will then satisfy the requirement of applying constancy of purpose in achieving customer satisfaction as required in the Nissan Way model..

Figure 3.3 Quality improvement tree diagram



3.2.5 Confirming the impact of each objective on company performance

If we refer back to Table 3.1 Review matrix of Managing Director's Business Plan, we can analyse the impact of each objective on the overall company performance. The NPMS states, refer to Section One Figure 1.1, as its objective that it is necessary to strive for *"Comprehensive productivity improvement activity with quality driven waste free activity that will realise a strong Product Making Plant."* If the NPMS is going to be used as an improvement tool then it must be established that if the targets set at Managing Director level are appropriate to the NPMS methodology and also if indeed each objective has an impact on the company's performance. The Business Plan objectives were divided into four categories, Quality, Cost, Delivery and People. Our discussion in chapter Two concluded that each one of these topics has an impact on company performance and success. Relating to the quality result, there is no doubt that a good PSI ratio

is going to impact on the company performance. Deming (1982) stated "*Capture the market with better quality and lower price, stay in business and provide jobs and more jobs.*" A disgruntled customer with a quality concern will not continue to buy the product, so market share will drop which will influence growth and bottom line profit for the company. The same applies to warranty which leads to dissatisfaction and on-cost to the company. On the cost issue the "into stock vehicle manufacturing cost" will also influence the customer in terms of acquiring a value for money product. Divisional total expense is just another dimension of "into stock manufacturing costs" but is more focused on eliminating waste from a support rather than a direct production cost aspect. The failure to meet delivery schedule would have a major impact on company performance in terms of not meeting the basic customer requirement of having product available when it is needed. The measurement of the effective value of stock reduction is an internal measurement that is really a barometer of efficiency of production rather than a measurement of delivery performance. This item, if correctly managed, could certainly lead to improved overall company performance but only after stability in each process was seen to be in evidence. The Shoshin programme should impact on the performance of the company in so much that new model replacement is very much part of the continuing life cycle of any organisation. What is in question is the way that the objective was set up it had no real tangible success or failure criteria. Finally the people issue in terms of motivation and knowledge has been discussed in this thesis at length and it is seen to be a major focus area and would have a major impact on the performance of the company. The application of the NMPS as a tool should also have a major impact on improving the company as discussed in Chapter Two. The Genba Kanri (GK) menu target was a vague interpretation of empowering the organisation to achieve success through shopfloor upliftment. This objective failed to explain the methodology of how this could be achieved and there was no real support item to measure this activity. In summary it can be concluded that not all subjects had an impact on each objective towards the company's improved performance. This process of analysis was then repeated for each level in the organisation by means of a first and second

level review. The first level review would establish if the target had been met. The second level review would investigate items in much more detail.

3.2.6 First and second level review of performance

The NML Head office requires a review of performance achievement according to the NPMS guidelines every six months. These reviews are carried out on a two-tier basis. Level one reviews whether the goal and control items set in order to meet that goal was met. If the goal is achieved then no further review is necessary. Level two analysis is carried out if the goal has not been met. The purpose of a level two analysis is to find the root cause of the non-achievement and implement corrective actions in order to achieve the goal. The 1998/1999 List of Human Resource Director's Control Items, referred to in Appendix 6, show a typical divisional review summary that took place at the end of June 1999. Hoshin Kanri step up items are separated from Daily Management items and reviewed by senior management with comments on performance. As can be seen, of the thirty items being monitored, one failed to meet target by more than ten percent and three items failed to meet the target by less than ten percent, all the other twenty-six items were reported as meeting target. When we refer back to the MD's Review Matrix in Table 3.1, however, both of the control items chosen under the heading of People issues failed to meet target. If we take another People issue example, as shown in Appendix 7, we see a first level review from another support department also indicating that the People target was met. In this case it indicated that the NPMS step up was successfully achieved with a score of 3.5, even though the MD's objective calls for a score of 4.0. This situation may be interpreted that either there was no meaningful alignment of targets, indicating no constancy of purpose, or a fear of failure was leading to data being distorted, as proposed by Wheeler (1993). Another example of faulty analysis is shown in Appendix 8. In this case a level two analysis took place against the failure to meet the goal of maintaining a local stock level of 4.5 days as shown in block one of the report. Block two shows the data had clearly not achieved target on eleven of the twelve-month period of monitoring. Block three, however, indicates that

the targets are met, but not on a constant basis. Blocks four, five and six attempt to analyse the situation but with little insight to the true situation causing the failure. At the end of January 1999 the NPMS department carried out a preliminary second level review establishing why the step up score was not being achieved related to the introduction process of the NPMS in NSA. This analysis, referred to in Appendix 9, highlighted a number of key areas that had not been able to apply the system as prescribed by the Japanese head office. It was concluded from the analysis at the time that a greater awareness and understanding of the NPMS was required in NSA. To this end seven improvement points were raised:

1. Promote B90 Standard awareness with Engineers
2. Challenge the NPMS focus in the Quality Assurance division
3. Encourage further training in low performing areas
4. Enhance the content of training activity to promote good results
5. Improve foreman focus for C and J methods
6. Focus on Important A and B Quality audit activity
7. Cascade the NPMS philosophy to lower levels on the shop floor

When this analysis was presented at the executive operations meeting, the senior executive representing the areas being challenged as not performing well, disputed the claim and denied that a problem existed. This could be interpreted as the result of a climate of fear in denying the true situation as suggested by Deming (1982).

3.3 Verifying the claim

In section 3.1 it was claimed that “Underlying fear and a lack of challenge in each area to apply a more focused constancy of purpose approach in NSA will continue to generate an inferior quality and productivity result.” If we now review the preceding sections it is evident that inferior quality and productivity performances have resulted in the 1998 /1999 targets not being met in NSA. In section 1.4.1 it

was established that a lack of trust prevailed between management and the workforce. This lack of trust not only prevails between management and workforce but also between different sections of management itself. The fact that targets had not come close to being achieved in this cycle of the business plan year is a sign of a lack commitment to the broad target agreed at the start of the period in question by each management member. It has been suggested that a more focused constancy of purpose approach be made to align each control item of all supporting and production divisions with the overall objective of the Company. It is not possible to put this down entirely to a factor of fear. There may be an element of fear present in the organisation but at this stage fear cannot be separated from incompetence or a lack of knowledge of the system requirements. Deming (1982) suggests that *a target that is forced is either meshed like gears or may be adjusted through fear to meet the requirement*. There is still some evidence, however, that targets are being forced but further analysis is necessary before a valid claim can be made that fear is a dominant factor.

3.4 Reflection of the 1998/1999 NPMS Hoshin Kanri programme

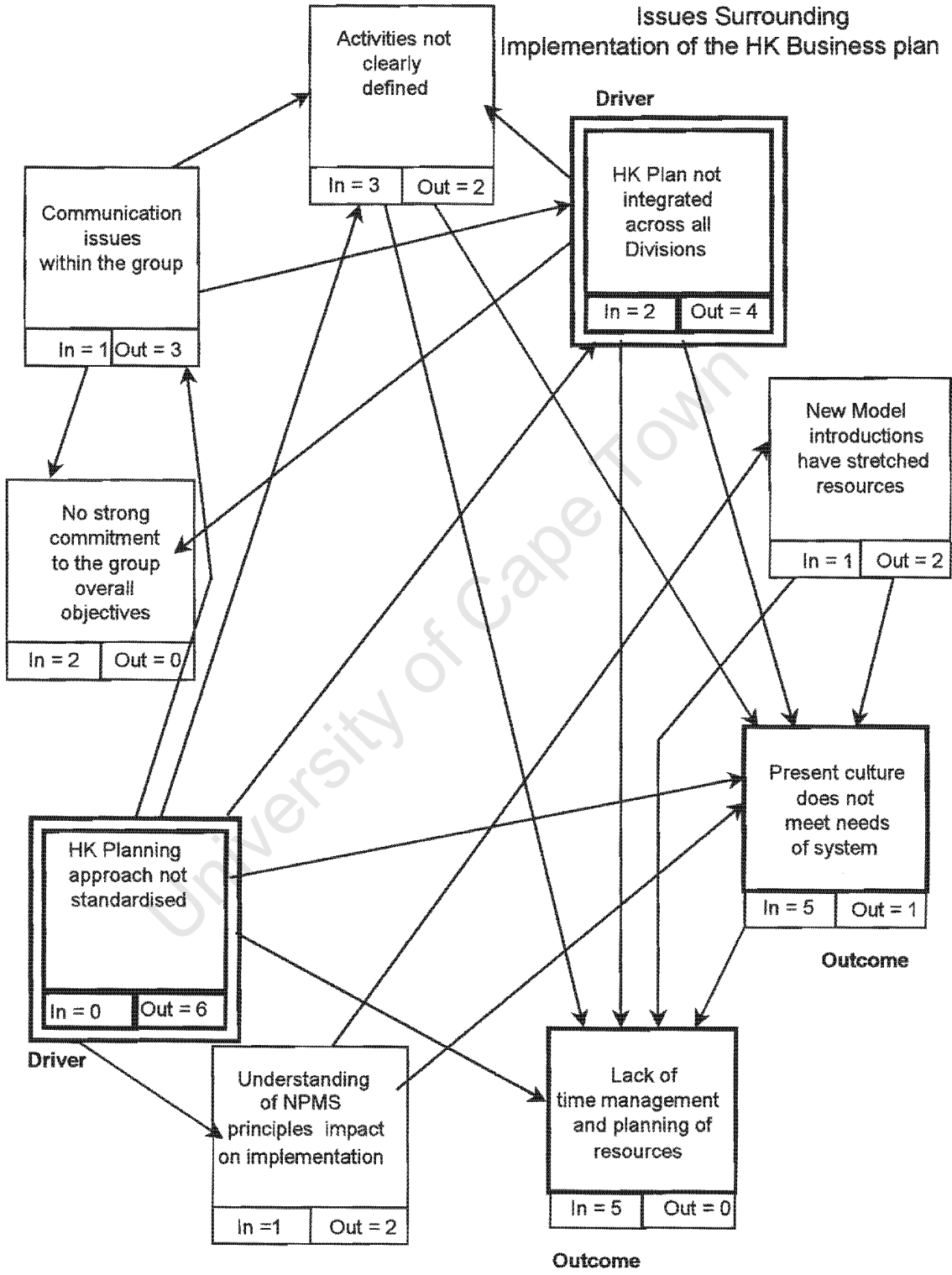
A reflection will be made in this section on what was achieved at the end of the 1998/1999 Business Plan year. At the end of June 1999 a diagnosis review was carried out and the following conclusions were made.

1. The Hoshin Kanri improvement items have become clearer but the establishment of suitable activities or countermeasures to accomplish the targets has not been sufficient.
2. The monthly reviews and follow up have not been detailed enough to think out the countermeasures when the non-achievement has been outside of the ten percent allowance.
3. Senior management have lacked the eagerness, consistency and leadership to achieve the targets set.
4. The analysis for finding out the root causes of insufficient achievement has been more quantitative than qualitative.

5. There has been insufficient co-operation and harmony across support functions to assist in meeting all the targets set at each discipline.
6. Too much focus has been given in some areas to achieving low priority items at the expense of more important issues.
7. Visibility of performance has not been shared to each level through display of data and communication to each area.

Issues surrounding the use of the NPMS as an implementation tool were investigated through the development of an interrelationship digraph, as shown in Figure 3.4. The process used followed the brainstorming approach using a cross-functional team drawn from various divisions within the organisation. This process was used in order to establish the main driving reasons for non-achievement of introducing the Hoshin Kanri process to the level required by NML as explained in their step up standards. Two main drivers were identified; the first being that the HK process was not standardised within the organisation, the second driver was determined as that the HK plan itself was not integrated across all divisions. The fact that the HK plan was not integrated across all divisions did have an influence on the commitment of the group. Outcomes were also identified, namely that firstly the present culture of the organisation does not meet the needs of the system and secondly a lack of good time management skills and planning are present. Only the general culture of the organisation was highlighted as not meeting the needs of the system. Detailed analysis relating to a culture of fear was not pursued at that particular time. Callaghan (1998), however, refers to management practices following interviews with various personnel at NSA and quotes: *"All of the interviewees were openly critical about NSA's management style, all of them inferring that it was a result of autocratic leadership."* Wild (1982) quotes Lady Bridget Plowden chairman: Independent Broadcasting Authority 1975-80 as follows: *"It may be lack of confidence in some managers in themselves as people which makes them fear to expose themselves as people to those to whom on other occasions they may have to give definite instructions."*

Figure 3.4-interrelationship digraph



Reflection from the matrix diagram indicated that management at NSA would find it necessary to focus on the culture of the organisation and on the HK planning and integration issues to improve overall performance.

3.4.1 Understanding the People issues

The people issues of the NPMS and Daily Management activities had been reported by the Director of HR, refer Appendix 6, as that all but four activities were on target. It was further reported that all the General Manager's plans as well as Manager's plans had been reviewed with subordinates. The performance management aspect of the Human Resource improvement objective on the HK plan, however, had not been consistently achieved although the revised performance management-reporting format had met target in terms of the introduction schedule. The performance appraisal system at NSA had been set up to monitor HK performance to target as well as the commitment to the NSA overall philosophy. Harding (1999) had reported that there was some dissension about the Performance Appraisal system being linked to the HK business plan performance in that some targets were too easily met in some areas with no real effort. This situation may also have been influenced by a fear of failure, not only by subordinates but also by their management who often set the targets. The HR review made comment that more focus would be needed to improve this objective, although the actual objective was not clearly defined. Training and Development had achieved the planned target in all but one month of the 1998/1999 Business Plan year. This result was cause for concern in that although reports showed that targets for training had been met, it was obvious from the poor quality level of analysis of performance that there was a low understanding of tools and techniques for this activity to be effective. The training of Engineers had also failed to reach the planned levels in terms of the Japanese requirement as reported in the Engineering plan. The engineers of NSA had not yet embraced the understanding of the Japanese philosophy of Chosen and Jissen (C and J). Outcomes of general shopfloor training and specifically GK training had also failed to reach the planned comprehension levels in terms of the Japanese

requirement as reported in the Production Director's Business Plan. The people issue relating to shop performance appraisal was also hampered by the fact that the NUMSA union had not bought into the process. Deming (1982) stressed that shop floor involvement is key to meeting customer satisfaction requirements, so this concern should be seen in an important light. Wickens (1987) refers to "*the 'Them and Us' syndrome still dominating, even though many managements like to delude themselves that in 'our company' we are one big family.*" The Hoshin Kanri 'People' related plans of the 1998 /1999 Business Plan year had still not been able to '*create the suitable atmosphere for making the organisation energetic*' as prescribed in the Nissan Map shown in Figure 1.1 in Section One. .

3.4.2 Linking the Cost issues to the Hoshin Kanri plan

Harding (1999) had reported that the 1997 / 1998 Hoshin Kanri Business Plan at NSA had taken a very broad view of cost issues and it had been difficult to interpret the results. The 1998 / 1999 target had been more specific in that the measurement had been tangible in terms of an 'Into Stock Vehicle Cost'. Although this target had not been met, it had given a lot more focus to the shop floor issues. Deming (1982) asked the question to 'Management': "*Do you manage by objective; do you manage by numbers?*" Deming was implying in these questions that targets and numbers alone will not improve performance, it is just the result. What must be in place to be really effective is an activity plan to achieve an improvement in cost as a direct result of an intervention. It was difficult to perform a detailed analysis of this Into Stock figure, as the financial reporting system was not linked to the numbers being monitored in the Hoshin Kanri plan. This same financial system also led to a lot of confusion in the company in that the finance department referred to their financial report as a business plan. This confused most of management with the Hoshin Kanri plan that was also referred to as the 'Business Plan'. The 'Into Stock' figure reported to support the cost reduction item, had been focused on the 'In Plant Assembly Fee', looking in particular at the new QW model which could be benchmarked against the overseas Yulon Motors plant in Taiwan. It was clear that more

tangible control items would have to be developed in order to be able to monitor an effective improvement of costs into the future.

3.4.3 Establishing the true Quality issues

At the start of the 1997/1998 Business Plan year a competent and experienced Japanese General Manager had been put in charge of the NSA Quality Assurance division. A communication problem initially had been apparent in this division and QA General Manager's Business Plan had not been communicated effectively to the operating levels below him. This condition continued through to the 1998 / 1999 period but some improvement in reporting techniques did have an influence on the shop floor quality condition, but not on the issues being reported. It has been established from the MD's Business Plan for the 1998/1999 period in Table 3.1, that the main focus for quality achievement was a 'Product Satisfaction Index' value of 110 TGW/100 vehicles. Wheeler (1993) warns us of the need to present data in context when he tells us that *'it is simple to compare one number with another number, but such comparisons are limited and weak'*. He says they are limited because of the amount of data used, and they are weak because both of the numbers are subject to the variation present in real world data. The fact that the target of 110 TGW was not met does not necessarily mean, according to Wheeler, that there had been no significant improvement in quality performance at NSA. The Engineering plan had shown some significant improvement in the dynamic VES results. The true quality issue is how the Customer perceives Nissan as a leading manufacturer of a quality product, and although customer satisfaction is being measured by the PSI index, many variables are able to distort the true improvement picture. The actual number of TGW showed deterioration and it had increased from the previous period. The TGW of the competition, however, also had increased, possibly due to increased customer expectations. The second measure was initial three-month warranty claims from the dealer. Detailed investigation was carried out on this item and it was found that although all vehicles came off the same production line there were large differences in the claims that were being processed by various dealers. This led to an investigation

that the warranty system might be being used to distort data. This again supported Wheeler (1993) who spoke of opportunities of distorting the system or distorting the data. A concern had been confirmed that certain dealers were exceeding the national average for paint repairs carried out on some showroom vehicles. It was argued that because of the Nissan paint warranty policy of paying for repairs without verification, certain dealers were taking advantage of this and were unnecessarily claiming through distorted figures. However, there were still many paint defects being produced in the paint process and not all of these defects were being rectified prior to shipment to the showroom. Deming's (1982) third point when he warns of '*of ceasing dependency on inspection to achieve quality*' was still not being supported by production who had not yet totally embraced the philosophy of right first time quality. This activity was not yet part of the business plan measurement

3.4.4 Reorganising the Delivery issues

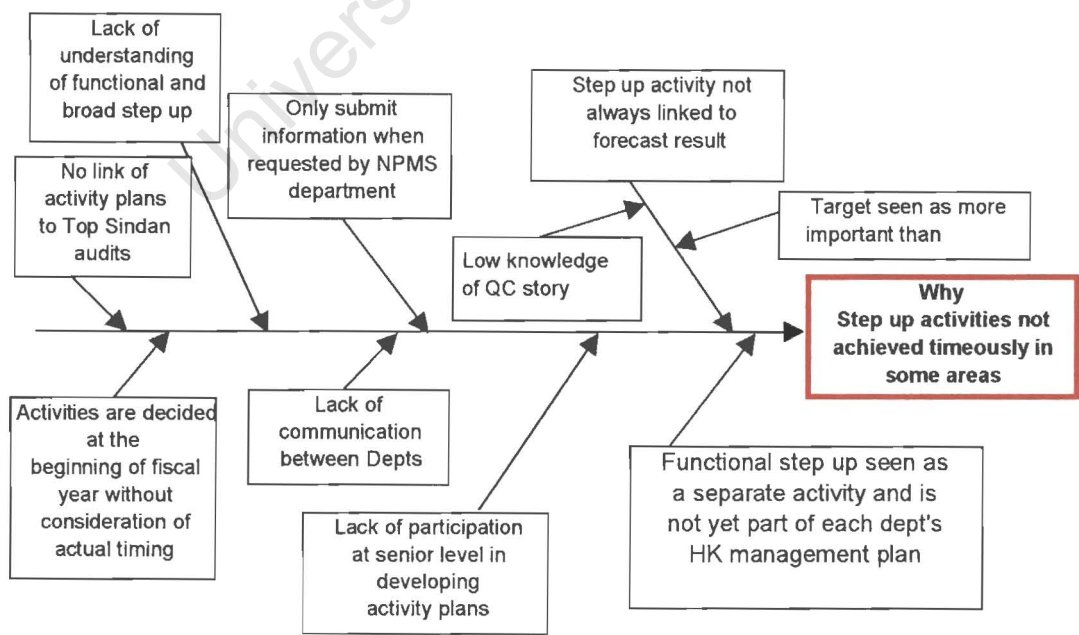
If analysis is made of the Business Plan of the Logistics Director refer, Appendix 10, it can be seen that it is very much targeted result focused, rather than activity focused. The NPMS training manual makes a distinction between Management By Objectives (MBO) and Hoshin Kanri (HK) which is Policy Deployment through process improvement. The MBO approach is one that focuses on the result itself and not necessarily on the methodology of how to achieve that result. No clear activity plans had been established to improve the delivery into stock performance. The monthly into stock ratio of 98% against schedule had not been achieved, other than the December month, for the last twelve months of the 1998/1999 Business Plan year. During this period, however, unlike the previous year, marketing had consistently increased the delivery schedule resulting in much higher volumes than were originally budgeted for. This was seen to be the main reason for not achieving the overall delivery target. This delivery achievement problem was exacerbated by the dual focus of trying to reduce inventory at the same time as applying a flexible approach to meeting marketing demand. A Just In Time (JIT) philosophy will have to be carefully studied if this balance of

Delivery and Cost issues is to be knitted together. Unlike many larger operations in Japan with a very high level of local content, NSA rely heavily on the importing of Completely Knocked Down (CKD) parts for the assembly process. This use of CKD stock makes the balance between inventory and delivery performance that much more difficult.

3.4.5 Bringing all the issues together

It has been found that although NSA have been working towards improving Quality and Productivity through the use of the Nissan Plant Management system as an improvement tool, it has not yet succeeded in making the breakthrough as a world class manufacturer. There are a number of issues that need attention if NSA is to improve to the level required by their parent company in Japan and other overseas benchmarks. The suitable atmosphere at all levels in the organisation must be created with a focus on the shop floor for success to be achieved. The interrelationship of each objective must be studied carefully and a way must be found to speed up the NPMS implementation programme.

Figure 3.5 Fishbone analysis.



To facilitate the need to speed up the NPMS introduction programme the general manager of the NPMS department carried out a fishbone analysis to find out why the NPMS step up activities were not being achieved in a timely manner, this analysis is shown in Figure 3.5 Fishbone analysis. It was concluded from the analysis that strong leadership is required from the senior executive of NSA to facilitate a change of approach from a commanding type of organisation to a learning type of organisation.

3.5 The problem formulation conclusion

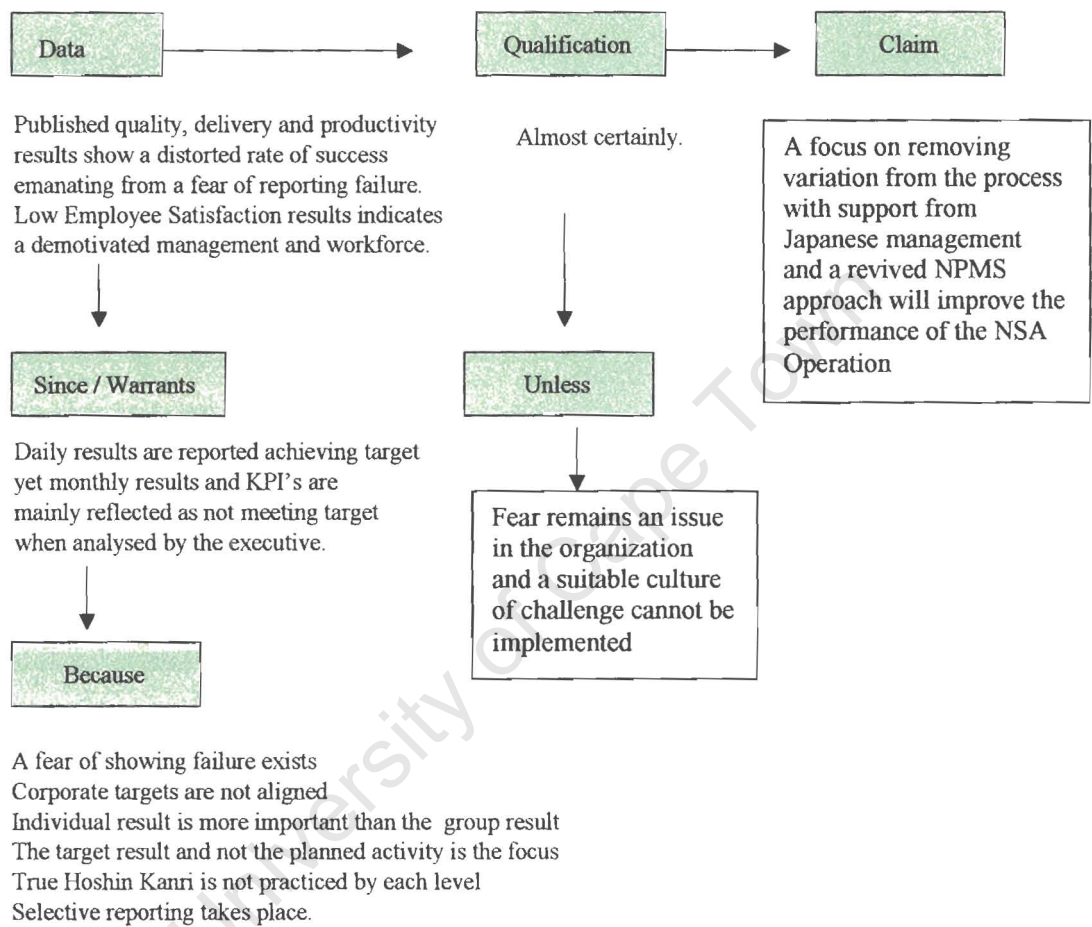
A climate of fear seems to exist in the company but this fear is suppressed through various filters at levels leading up to top management. The level of fear varies across functions and in some instances fear can be confused with incompetence. There is a definite need to ensure that a constancy of purpose is generated throughout the organisation through alignment, across all divisions, of goals and objectives and that the Hoshin Kanri process appears to be a good tool to enable this process. A danger exists that this Hoshin Kanri process can be abused by individuals who are not prepared to work in a harmonious way with other functions in order to meet global goals that stretch across divisions and through hierarchies. The important area of the supervisor as the link between management and shop floor needs to be reinforced through applying the Chosen and Jissen (C and J) principle of challenging targets voluntarily. A focus on the complex delivery issues needs to be made in order to satisfy a variable automotive vehicle market in South Africa.

3.6 Addressing the problem

The underlying fear and lack of challenge to set stretch targets in certain areas will almost certainly result in failure of the company to meet its objectives unless a focused approach is put in place. This focus needs to come from the Japanese in terms of changing their role from advisors to role players in the organisation. Guidance can come from the implementation of the Nissan Plant Management

System across all areas with a focus on removing variation from each process and being able to operate in a standardised way. as shown in Figure 3.4 Revised claim.

Figure 3.6 Revised claim



3.7 Conclusion

The 1998 / 1999 business plan year had attempted to make full use of the Hoshin Kanri process to improve the People, Quality, Cost and Delivery performance of the NSA Manufacturing Company in line with the NPMS framework described in chapter one. The Managing Director's review matrix, refer to table 3.1, shows that the majority of targets were not achieved. On further analysis, however, it can be seen that many of the results obtained for the various targets and control items at support levels show that the overall objective of improving productivity

and satisfying the customer was not fully supporting the overall objectives of the company. Analysis showed that there was not a common thread when setting company wide targets. The People focus failed to address the main issue of cascading the quality and productivity philosophy down to foremen and operator level as highlighted by many of Deming's (1982) fourteen principles. The NUMSA union had not been involved with the process and was resisting any form of productivity improvement. The NPMS Map refer Figure 1.1 in Chapter One, shows that the foundation of the five global principles of personnel administration needs to be implemented to support the pillars of improvement. The need to ensure built in quality as proposed by Deming (1982) did not receive sufficient attention, whilst soft data may have been distorted to give an impression of good performance. The difference in the profiles of the South African management compared to the Japanese management was seen in the way the Hoshin Kanri targets were set. There were no stretch targets set by the local management particularly in the support functions. The problem statement that "Nissan South Africa do not currently have a motivated workforce that embrace the concept of voluntary continuous improvement has been proven. The Hoshin Kanri process still lacks the consistency of purpose to focus on the real issue of satisfying both the internal and external customer in terms of quality cost and delivery. A climate of fear in which portraying a good result is seen as the main driver, irrespective of the process conditions and built in variability to the system is evident. A further lack of consistency in daily activities in which resources are not being used in an effective and profitable manner is generating waste and is not leading to the productivity required. It is therefore essential that focus be given to driving out fear and focusing on constancy of purpose.

CHAPTER FOUR

THE SECOND CYCLE OF ACTION LEARNING

4.1 The changing management role in developing the 1999/2000 business plan

In the previous chapter the first cycle of action learning at NSA revealed that the Hoshin Kanri step up activity, linked to the NPMS at NSA, was not sufficient to achieve constancy of purpose through all divisions using just the ideas of management as proposed by W.E. Deming (1982). Reasons for the non-alignment of targets as set out on the NSA 1998/1999 Business Plan were varied in terms of a fear of failure, linked to protection of individual achievement at the expense of the group, as well as a certain amount of incompetence and / or lack of knowledge. It was reasonably clear that each function had not completely set their targets based on the Managing Director's Business Plan. The targets set on support plans suited each individual and division, rather than the collective needs of the organisation. However, the incumbent MD in his 1998 /1999 business plan had not clearly stated what control items and subsequent support targets were necessary to enable his targets to be achieved successfully. In this chapter we will look at how the role of senior management changed with the replacement, during 1999, of the South African MD due to early retirement, with a Japanese Executive Vice President (EVP). We have previously established that the NPMS is a sound base as an improvement tool, and that it supports most of the Deming (1982) principles as described by Harding (1999). It has now become necessary to investigate the deeper management and people issues of why the system was not applied as successfully in South Africa as in Japan and Taiwan. The second cycle of learning will begin with a detailed analysis of the expected role of senior management leading to an improvement process at NSA. A view will be taken first of the entire generic role of management and how this role is seen from the theoretical as well as the practical viewpoint. The changing roles of management at NSA will then be analysed and how that effective management through the use of the Hoshin Kanri methodology can lead to the achievement of set targets.

4.2 Redefining senior management at NSA

In his book "How to Manage" Wild (1982) researched one hundred and twenty three recognised world experts for their opinions on the art of management. Wild in his introduction stated that many of the contributors tend, explicitly or implicitly, to see management as being in part or wholly to do with people. There have been many other views of what can be defined as management practice. Historically the more common approach has been to label the act of management as planning, organising, leading and controlling. Mintzberg (1994) states "*The integrated job of managing has been lost in the conventional way of describing it.*" In Chapter Two we discussed systems thinking and took notice of Ackoff (1994) and his theory that individual parts when taken away from the whole have little or no substance. It can be said that like a 'systems model', the role of the manager has to be seen holistically and not broken down into individual segments. Mintzberg (1994) talks about the person in the job. He describes the manager as a person with values that have probably been set through experiences and competencies that have been acquired through knowledge and converted into a set of mental models. The person depicted by Mintzberg can be embedded in a given job in order to perform managerial work. He goes on to say "*Embed the person depicted in a given managerial job and you get managerial work. At the core of it is some kind of frame for the job, the mental set the incumbent assumes to carry it out.*" What Mintzberg is saying is supporting the Deming (1993) theory of profound knowledge and his tetrahedron model that depicts a framework constructed of four principles consisting of applied management, influenced by our mental models which have been developed through learning applied to our systems thinking. The tetrahedron described is very much influenced by the mental model that has been shaped by individual experiences. The previous MD of the company had his own mental model based on thirty years of experience working for NSA. Although he had been exposed to greater volumes of knowledge, including many of the NML B90 Standards, and other useful data that could have changed his mental model, he may have been stuck in his own paradigm. The NPMS model recognises this and asks that we "Remove the old stereotype." Parker quoted from

Gibson (1997) talks of defining a Paradigm, quoting Adam Smith's definition of a paradigm as "*A shared set of assumptions. The paradigm is the way we perceive the world; water to the fish. The paradigm explains the world to us and helps us to predict its behaviour.*" Parker argues that most of the time it is difficult to predict things with our paradigms. But paradigms do give an advantage of being able to create a valid set of expectations about what will probably occur in the world based on "our shared set of assumptions." Revans (1987) suggests that there is a scientific method available for management. He states "*Between science, on the one hand, and technology on the other, there is a simple and legitimate parallel that not only offers us an exercise in metaphysics, but also suggests a development of management theory.*"

The five steps of his management strategy then become:

- observations on the field – or the determination of what needs exist and what artefacts have already been produced to fulfil those needs (survey);
- the formulation of theories based upon these observations – or decisions about what further or different artefacts to produce (policy);
- the design and conduct of experiments to test these theories – or the establishment of methods of manufacture (operations);
- the comparison of experimental results with those predicted by these theories – or processes of audit (inspection); and
- the rejection, modification or confirmation of these theories in accordance

This Applied Management is being introduced at NSA through the application of the NML production way supported by observations carried out by various Japanese specialists. Most of the five steps Revans (1987) advocated for management strategies have been put in use at NSA through the application of the NPMS improvement tool. The development of a management framework is taking shape in the form the Hoshin Kanri (Policy Management) step up activity associated with the NPMS Map. What Revans and NML are advocating is an extension of the Shewhart Plan, Do, Check, Act (PDCA) activity that was proposed by Deming (1982). NSA are using the PDCA cycle in the form of the

regular Hoshin Kanri planning, audit and review sessions at various management levels from executive management to supervisor.

4.2.1 A new approach from a Japanese EVP

With the appointment of the new Executive Vice President from Japan an immediate change took place at NSA relating to management style. The role of the EVP changed from that of an observer to one of responsibility and accountability and with this change came a broader understanding by the incumbent management of the NPMS activity. As Mintzberg (1994) had pointed out, the new person in the job will bring with him his personal knowledge and competencies and also his own mental models. In this case the EVP's experiences had been developed through a practical application of the Nissan Way, both in Japan and at other overseas countries, using the NPMS as an application tool. One of the first changes that the EVP made was to restructure the focus of action of the monthly operations meetings. These had been previously structured in the form of Quality, Cost, Delivery and People feedback sessions every Monday afternoon, with the subject alternating each week. There was also a monthly Manufacturing Board meeting to discuss more strategic issues. The topics at these meetings were discussed in a very strategic and generic way with no real focus on detailed operational activity plans or tangible data. The minutes of each previous meeting was the focus of action and tended to be repetitive in nature. These meetings were immediately restructured so that all operations meetings would take place in the third week of each month and the focus of action would then be the specific performance data of the previous month linked to the Business Plan objective. Another innovation was the attendance at each meeting of the relevant direct manager involved with achieving the actual result. The monthly Manufacturing Board meeting was also replaced with Strategic Operations meetings that would focus on specific topics important to the business that was relevant to that particular month. The renewed purpose of each of these meetings was to be able to ascertain whether or not the company was on track to meet its committed targets.

4.2.2 Effect of restructuring of meetings

The restructuring of these meetings, in July 1999, had an immediate affect on the feedback of the business performance. The focus of action was now turned to actual results emanating from improvement activities which each divisional head had to explain to the meeting in detail. If the divisional Head did not have the full understanding of the specific activity, the relevant manager would be called upon to explain the detail. This activity brought a number of benefits to the meetings including a way of *'defining top management's commitment to ever-improving quality and productivity'* which is the fourteenth of the Deming (1982) points on improving management. In order for top management to be able to report on the real issue, presenting the real data at the operations meeting, they had to become far more involved with the actual day to day activity through understanding the process. The new EVP had a very good in depth knowledge of each process and was able to ask searching questions to establish the understanding of each senior executive of the actual performance criteria and result. This feedback and debate on the real issues created a more open discussion and over a period of time reduced the fear factor that had been previously present in these meetings. If a target was not met according to the data being presented, the EVP would openly discuss the issue and either suggest an alternate action or ask for other opinions to address the problem and not the individual presenting it. In the early stages of this new format there was some resistance to the new approach but over time this method became the accepted normal activity. A paradigm had now been changed and a new paradigm shift was emerging.

4.2.3 Changing the method of reporting information

The agenda for the new monthly operations meetings was changed to be more result focused than disseminating general information. The meetings also took on a more cross-functional approach with each Director reporting on interrelated activities. An example is given below of the agenda of a 'Cost Operations' meeting:

Agenda:

1. Report on Business Plan results
2. Overall cost reduction feedback
3. Divisional finance review feedback
4. Assembly fee results and analysis
5. Fixed cost results and analysis
6. Warranty costs results and analysis
7. Inventory costs and analysis
8. Local and CKD parts cost analysis.

From the above agenda it can be seen that there was a far greater focus on costs that were directly linked to the manufacturing process rather than pure balance sheet reporting that had been the traditional form of reporting at a financial operations meeting. Productivity and quality improvements were now being directly linked to financial reporting. The person responsible for reporting the assembly fee result and performing the analysis was not the Director of Finance, as was the traditional approach but rather the Director of Production, who was actually controlling the expenditure. Instead of the cost meeting being focused on pure numbers, the method of reporting had now moved to discussing the processes that produced the numbers. A breakthrough in understanding of the NPMS and also the knowledge of variation from the process was now emerging at executive level.

4.2.4 Knowledge of variation at management forums

By analysing each Divisional Business Plan as an agenda item, as discussed in section 4.2.3, it soon became apparent that there was considerable variation in the figures being submitted each month in all the disciplines of Quality, Cost and Delivery. Wheeler (1993) states *“Before information can be useful it must be analysed, interpreted and assimilated. This process of digesting data has been widely neglected at all levels in our educational system.* The new operation meetings were still interpreting broad data, rather than reviewing specific ‘control

charts'. At this stage of changing the management paradigm it was sufficient to know that each process was 'out of control'. The extent to how much 'Out of Control' the process was did not justify detailed attention at this stage of NSA's development. When some artificial deeper explanation was about to be given by a member of management, the reply from the EVP would be "*Never mind, it is not important now.*" It appeared that it was the intention of the EVP to apply various remedial activities to at least reduce the variation to acceptable levels before focusing on more complex statistical control techniques.

4.2.5 EVP verification of actual situation

In the Managing Director's Business Plan review referred to in Chapter Three Table 3.1, it can be seen that under the heading of GK menu, a negative result was achieved for the whole year. The previous MD's mental model of the NPMS had not included the full requirement of this GK step up item that was common practice in the NML companies. The B90 Standard for management control developed as a support for the NPMS, required that the plant manager or in the case of NSA the EVP, undertakes to regularly review the actual situation relating to performance results on the shop floor and support areas. This review is made in terms of a Top Sindan audit that was referred to in Chapter One, Section 1.2.3. The EVP undertook to utilise this audit process and planned to conduct fifty such audits in the financial period from July 1999 to June year 2000. This was a new innovation at NSA and at first was not understood by either the rest of the executive nor the areas that were subject to the audit. The purpose of the Top Sindan was to gain an overview of each activity that was taking place in the Company by directly interfacing with middle management and supervision. The Business Plan of each Director was the departure point of the audit and the EVP would follow an audit trail to the lower levels of the division to confirm that each subordinate was giving support. The EVP was not so much concerned with the target set but more with the proposed activity to achieve the target. It was up to the person who was the focus of the audit to be able to convince the EVP that he was on the right track to support the overall Business Plan objective.

4.2.6 Psychology of management audits

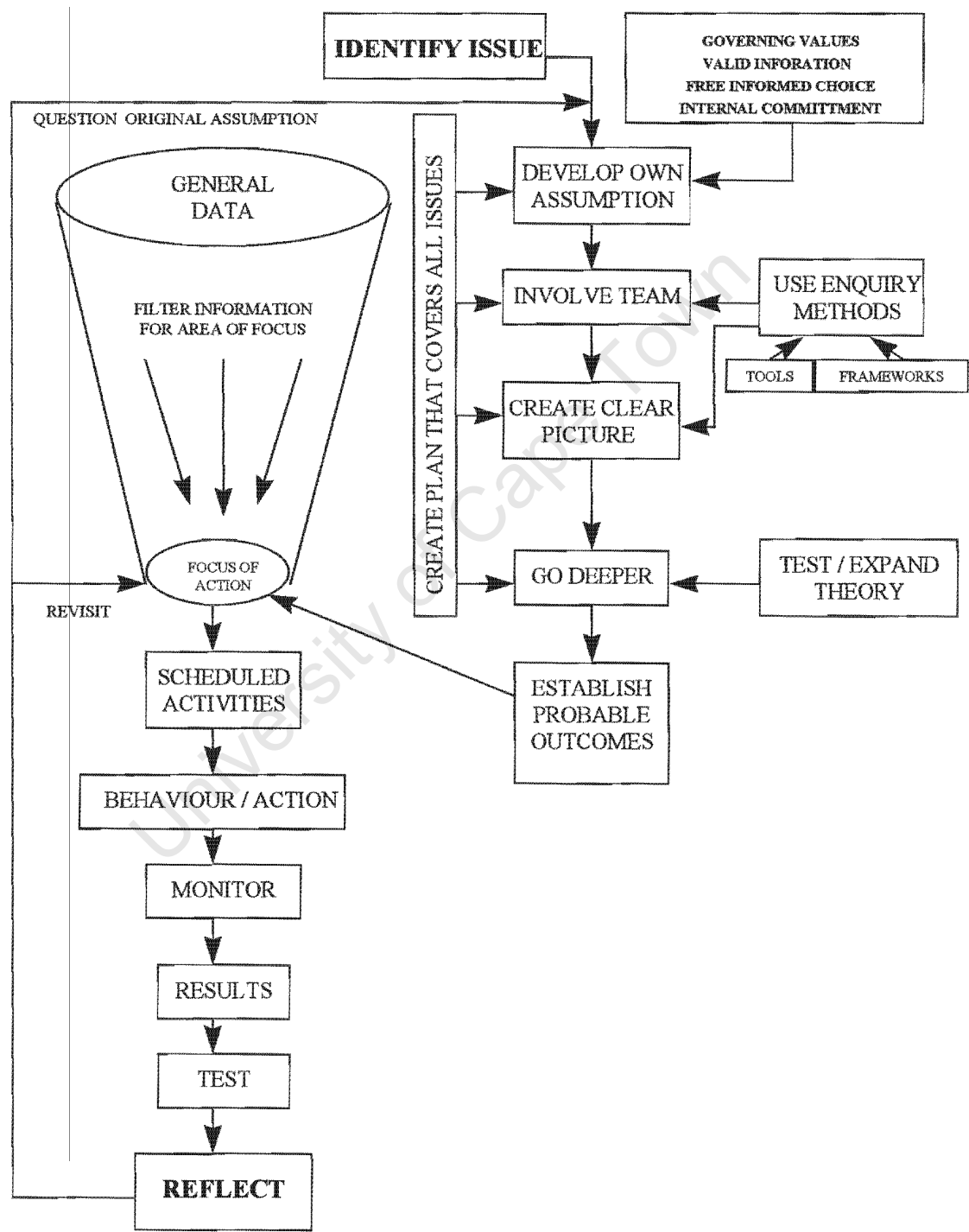
The EVP selected the areas in the organisation that he thought were not performing at optimal levels based on the feedback he had received at the various operation meetings. Rhodes (1991) speaks of *'the mental processes rather than data, that enable conceptual leaders to be effective, helping them to pre-select in advance, identifying what will matter to them, what will be relevant even when apparently remote. They can sift through things that belong together, distinguish between things that seem similar and see the causal connection between separated events.'* From the perspective of each auditee there was an initial reaction of 'fear' to the Top Sindan audit. NSA had been subject to many types of audits in the past seven years and most of them, particularly the ISO 9002 (1994) audits, were accompanied by a findings report and often this meant more unnecessary work was to be carried out. This initial reaction of fear soon dispelled when it was found that the audit was not to criticise or condemn an activity, rather listen to a point of view or concern and if necessary create a solution to remove an obstacle to success. The important aspect of the audit was for the EVP to grasp the real situation and for each level of supervision to understand that senior management was aware of concerns as well as challenges and was prepared to become involved with solutions. This was the first sign of fear being driven out of the organisation.

4.3 Using a framework to identify issues, establish probable outcomes and reflect on results

In order to structure the approach to answering the claim deriving from the Problem Statement, we need to develop an action learning framework to assist in this process. This framework was developed as shown in the following Figure 4.1 Action Learning Framework. The framework was used to develop the second cycle of action learning to lead to 'driving out fear and focusing on constancy of purpose'. It was anticipated that this would improve the quality and cost effectiveness of the Nissan product to the international levels required and to satisfy the customer demands and at the same time improve the productivity of

NSA. A focus of action needed to be developed and this was based on the activity plan derived from the Business Plan of each individual subjected to audit by the EVP.

Figure 4.1 Action Learning Framework



This broad framework had been previously used following the results of the 1998 / 1999 Business Plan to analyse its effectiveness and will now be used to develop the focus of action for the successful introduction of the 1999 /2000 Business Plan. In the previous Chapters it was suggested that the NPMS is a valid tool to be used in the improvement process and the broad principles of Hoshin Kanri was chosen as the tool for improvement. We will apply this assumption as our broad identified issue and using the framework in figure 4.1 we can start the action learning cycle by deducting that this is an assumption that was developed based on a number of contributing factors. Harding (1999) discussed that the governing values of the NPMS were the quality and productivity focus that the Nissan Map possessed. Policy statements issued in line with the NPMS principles supported the Deming (1982) values. The data emanating from the 1998 /1999 business plan reviews gave valid information that could be used in the learning cycle in terms of NSA Quality, Cost and Delivery performance being insufficient to meet Nissan world standards. Other data collected from other overseas countries, compared to NSA, using the same NPMS methodology to an improved level, had shown superior results. There is an amount of free informed choice that has been used in the Hoshin Kanri process to allow for some flexibility when agreeing on the control item methodology and activity plans to be used, this flexibility was exercised. On reflection of the 1998 /1999 business plan the framework shown in Figure 4.1 was not followed extensively in the first cycle of learning. It was difficult to recognise an internal commitment to the broad business plan that was established for the broader company's objectives. The control items set by each area were focused on protecting the individual rather than supporting the group. This action had supported the problem statement developed in Chapter three of a lack of constancy of purpose. Although this plan was meant to cover the important Quality, Cost and Delivery issues there was not a sufficient amount of teamwork used in the development of Business Plans by each area. A clear picture for the whole organisation, required by the framework in 4.1, was not created as to what were the real issues and the subsequent probable outcomes and these were not fully tested. The expected outcomes, now that there was focus on the actual methodology rather than the result was at least an estimate of an actual cost or quality figures that was

now more tangible to predict. These issues will be discussed in the next section where a more focused use of the framework will be applied.

4.3.1 Identifying the underlying 1999/2000 business plan improvement issues

There is no doubt that it is necessary to improve productivity and quality for the NSA operation to stay viable within the Renault / Nissan alliance. It is also necessary to understand the basic improvement issues that will allow NSA to become competitive. The action learning framework shown in Figure 4.1 will be used to question these issues. C Handy (1989) developed his spiral of learning and this will be used in trying to develop an answer to the question highlighted in the problem statement. It is envisaged that a number of reflective cycles will have to be used before a sound answer to this problem statement is forthcoming. In the first cycle of the Hoshin Kanri activity discussed in Chapter Three, the focus of action was more on the methodology of the system to be used, rather than understanding the purpose of the methodology and the ensuing target results. A single loop learning approach was followed when the focus of action, which was the methodology itself, was revisited. An attempt had been made to improve the Quality, Cost and Delivery performance of 1997/1998 business plan period but basically the same scheduled activities had taken place for the 1998/1999 year with the same mental model of senior management. Little was done to question the original assumptions that the previous MD had made in how new targets were going to be realised. It is anticipated that the second cycle of learning that will be followed in this Section will show some improvement in results by identifying the real issues that was preventing successful implementation in the 1998/1999 business planning cycle.

4.3.2 Developing new assumptions

At the start of the 1999/2000-business plan cycle the Executive Vice President at NSA became more involved with the Hoshin Kanri development process. Although he was in a position to do this in the previous cycle, he had taken the

option of not questioning the incumbent MD at the time. Wickens (1993) discusses the respect that the Japanese have for seniority and it is fair to assume that this was the case with the Japanese EVP. At the start of the 1999 / 2000 cycle the EVP began a different approach to the process of Hoshin Kanri and through his Top Sindan audits became more involved with the day to day shop operations. The target that was set in 1998/1999 cycle was to move to step up level four on the NPMS diagnosis model, this was not achieved and an analysis of why can be found in Appendix 9. This NPMS step up activity would be partly achieved through the cascading of business plans down to the foreman level. The scheduling of regular Top Sindan audits would then enable senior management to focus on what was actually happening in their divisions by analysis of each activity plan. The new assumption, supported by the Japanese EVP, was that to realise the consistent approach to quality and productivity and meet the set targets, the business plan needed to be effective with a constancy of purpose from each division supported by a meaningful activity to reach each target. The actual subordinates, producing the actual results, had to be freed from any fear factor that could be detrimental to achieving the improvement target. This covered all support divisions as well as the actual production departments. A schedule of top level audit, feedback and assistance in correcting any concerns found in any area would then monitor this improvement. This action supported the VSM as described by Beer (1985) where the S1 function performs the work and is adding the real value. The S2 gives meaningful support and now senior management adopted an S3* function of audit and feedback rather than just giving instructions. Although in this case the auditor was also performing in an S4 and an S2 function as well. The new assumption, therefore, can be stated as that in order to improve the overall Business Plan a focus must be given to the actual shopfloor activity with support coming from executive management.

4.4 Revising the NPMS introduction process for 1999 / 2000

Although the management of the manufacturing plant had learned some lessons from the 1998/1999 Business Plan, the launch of the 1999/2000 Business Plan now

had the complete support and commitment from the new EVP and the executive members. The senior management had now developed a team approach to focusing on the issue at hand. Following reflection of the previous year's performance, a clear picture emerged as to what was necessary to improve the business plan performance results. The following activities emerged after going deeper into the reasons for previously failing to reach the set targets. The activities shown below were suggested prior to the start of the new fiscal year:

- The results of each monthly meeting should be clearer and given more visibility
- The main focus area for each month and the important support activities should be announced.
- Top Sindan audits should be held regularly.
- Each function's operations meetings (Quality, Cost and Delivery) should be more quantitative.
- Functional business plans should be drawn up.
- Budget and actual expenses must be controlled through not only finance but also a champion of each general expense item.
- When business plans are drawn up, cross-communication of each section's or area's plans should be carried out more frequently.
- The performance appraisal system should be modified to allow for a larger portion of remuneration to be given for achievement of business plan targets.
- The organisation structure should be changed to a simpler one and more efficient one.
- The core business process of the company must be strengthened with less focus on non value-added support areas.
- More attention must be given to the "Nissan Way" philosophy through greater understanding of each section's role and B90 Standards.

These statements were now very supportive of not only the NPMS principles as described in the B90 support documentation but also those of Deming (1982).

4.4.1 Developing a plan of activities for the focus of action for 1999 / 2000

A new focus of action followed the reflection process described in our learning framework in figure 4.1. It was then established that the focus was the actual Hoshin Kanri business plan item activities that were being developed by each senior executive, with a greater emphasis on quantitative figures cascaded to lower levels of the Company. The Production Director's (later to become the Senior Vice President) Business Plan refer to Appendix 11 was revised to suit this focus with more meaningful objective measures and Control Items, the main focus being on the assembly fee in terms of cost per unit. From the previous year's result, which showed an average of the final three months of the business plan year, meaningful targets could be set. Based on the specific activity scheduled for improvement and the selection of more relevant Control Items, predictions could be made relating to the probable outcomes. These predictions were set in terms of measurable targets. This was then broken down into the three main categories of Quality, Cost, and Delivery. From the targets that were set, further control item targets were established for each person reporting to the Director. Each of these targets was supported by a specific measurable activity that was now the focus of each divisional meeting. Each activity was then allocated a number of control items that could be used to measure the ongoing activity plan to track its success. A company-wide tree diagram was used to establish the link between objectives and control items across each division as well as within divisions. This was the first phase in achieving the constancy of purpose that Deming (1982) had prescribed. In the previous business plan year, as discussed in chapter three, most of the targets that were set, did not support the EVP's overall target. The new plan was now based on actual activity implementation programmes that were expected to deliver meaningful results. In order to implement the improvement activity it was necessary to cascade the Production Director's business plan down through each level and eventually through to foreman level on the shopfloor. The Action Learning Framework shown in Figure 4.1 calls for the involvement of the team. This was achieved by each Director now giving support through an S2 role according to the VSM, setting meaningful targets that supported the broad

objective of the organisation. An example of this can be seen in appendix 12, which shows the Engineering director's business plan. This plan moved away from the traditional measurement items of process control and maintenance into a direct support for quality and cost improvement. The new EVP saw the responsibility for improving quality dependent on the effectiveness of the process as much as the improvement of the operator. Control items were set that went deeply into the actual performance level of each model and also by each engineer who was responsible for the process. The support areas could now be measured on improved performance through reducing waste which led to cost improvement. An example of an engineer's activity is shown in Appendix 13.

4.4.2 Improving behaviour / action at management level

Harding (1999) spoke about the importance to focus on the shopfloor to achieve results; this supported the theory put forward by Deming (1982). Although this approach cannot be denied, it was found that firstly the behaviour and action of management needed to be aligned with the company objectives. In order to overcome the hidden fear in a management that did not want to fail in their achievement of business plan results, a new mindset was required. This mind set change would involve the development of a business plan aimed at reducing all non-value adding activity. This business plan would entail identifying certain concerns and thinking out countermeasures supported by activity plans, to overcome them in the best interests of the group and not of the individual. From the review of the 1998/1999 Business Plan it became evident that a focus needed to be given to broader cost issues. There was a particular need to focus on the capability of each division to contribute to overall profitability and long term growth of the organisation. Although the focus of action was originally on the senior management it was also recognised that the behaviour and action of supporting functions must also change. The coherent cost focus was determined by aligning each cost item through the development of a tree diagram that would lead to a competitive cost per unit which could then be measured through

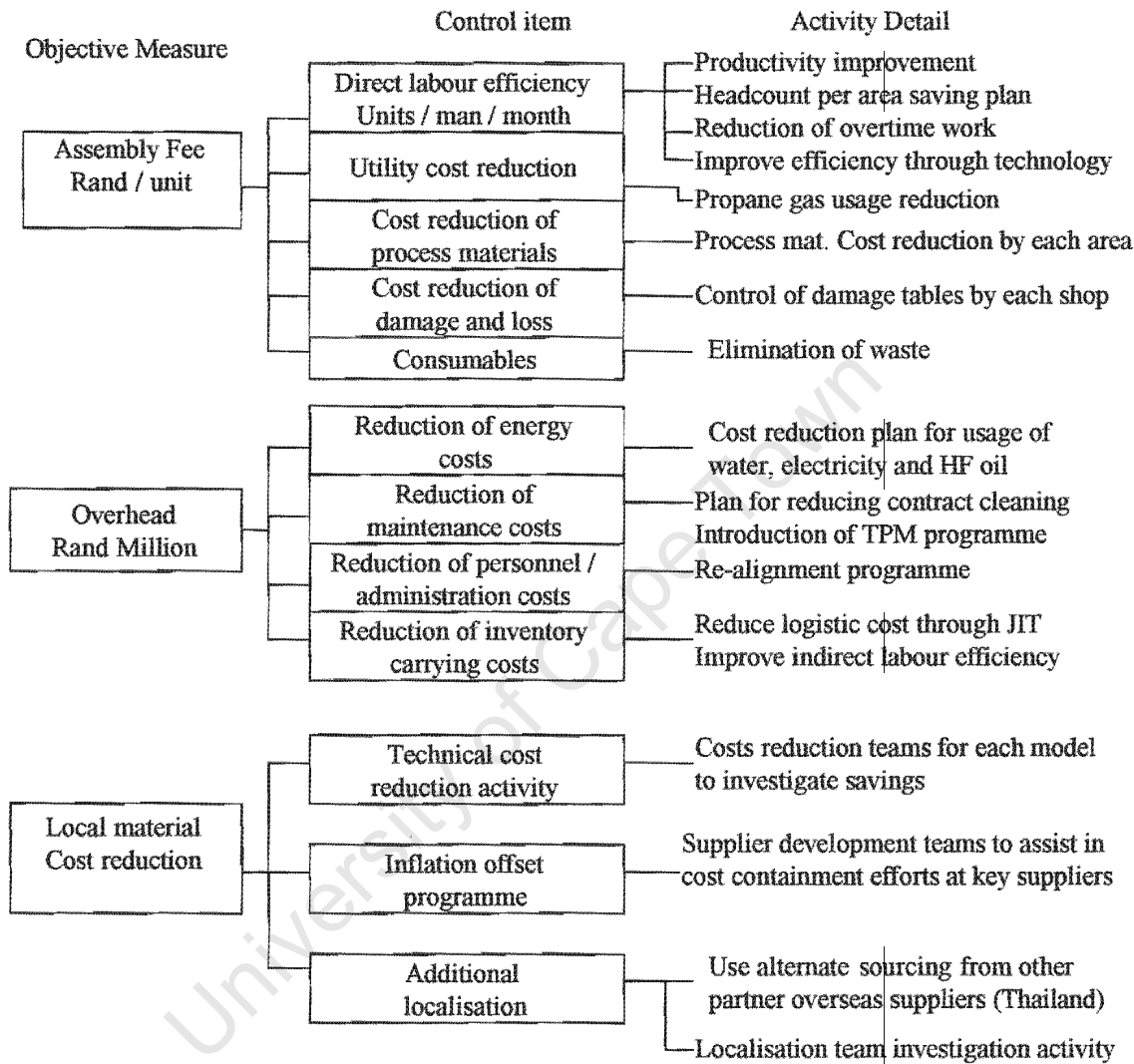
Benchmarking other Nissan plants around the world. These costs could be broken down into the three main categories as shown below:

- Assembly fee in Rands per unit.
- Overhead costs in terms of Rands.
- Local material cost reduction.

These targets were all relevant to the Company's efficiency in terms of survival and long term growth. In order for these targets to be meaningful it now required a change in the behaviour of senior management to work together in harmony to achieve these results. In his research into making the Balanced Scorecard (an alternative approach to Hoshin Kanri) pay off Todd Manas (1999) stated that objective setting is most of the battle. He went on to say that instead of prescribing traditional or predetermined indicators, the balanced scorecard approach advocates the use of measurements and targets that best suit an individual organisation and its specific strategic position. Score cards could be properly customised by task groups forming a team to assess and recommend objectives. In the case of NSA a team was developed to construct the tree diagram that is shown in Figure 4.2 Business plan commitment for competitive cost per unit. The cost objective required that the Production, Engineering, Quality and Purchasing divisions all have a common focus on achieving the desired target. Each division was also instrumental in developing the control item measurements that would indicate performance achievement linked to the activities indicated in the tree diagram shown in Figure 4.2. Each area in consultation developed more detailed activity plans and control items that were cascaded down to lower levels that would all support the overall company Cost per Unit target. The objective measure could now be set on the business plan of the Executive Vice President in terms of cost per unit produced. The EVP could then cascade his control item of Units per Man per Month to the Senior Vice President of production. The SVP of production was then able to cascade his control items to his various production managers for productivity improvement, the control of overtime and headcount reduction. By

using this cascade method across functions a team approach to cost improvement was established.

Figure 4.2 Business plan commitment for competitive cost per unit



The implementation process of achieving the cost goal was now set in place and described on each division's Business Plan.

4.4.3 Monitoring the behaviour

A number of monitoring activities was set up in the organisation to ensure that the planned activities were carried out. The forums were now in place through operation meetings to view the ongoing performance of Cost per Unit through the

presentation of control graphs at each meeting. The EVP could also clarify the actual activity through his Top Sindan audits of each area. These Top Sindan audits were also scheduled in advance so that it was not an ad lib activity but a predetermined action based on the importance of each activity. Other monitoring activities were carried out, the main one being the introduction process of the NPMS programme itself. In Chapter Two the relationship matrix shown in Figure 2.3 indicated the relationship between the NPMS step up programme and the actual QCD result. A monthly status report was compiled as to the implementation achievement and this was monitored for achievement to standard through the following areas and categories as shown below:

- Progress of the introduction each Management Plan item
- Progress of the Cost step up activity plans
- Progress of quality improvement plans
- Progress of Manufacturing and shopfloor activities
- Progress of Production Engineering and staff capabilities
- Progress of delivery performance
- Progress of productivity improvement activities
- Progress of personnel improvement issues
- Adherence to New Model introduction Standards

Regular audits were carried out on the implementation progress and a monthly report was issued to Japan for monitoring purposes refer to Appendix 14. This monthly review method proved to be successful in that it linked the activity plan with the level of achievement of each functional step up activity diagnosis result. The NML head office was then able to compare this diagnosis result to the actual QCD performance result being reported.

4.4.4 Analysing the results

The overall Business Plan results were due to have been reviewed at the end of December 1999. In November a dramatic change took place in NSA in the form of

a re-alignment programme prompted by Japan. This programme saw a substantial reduction in the staff complement at NSA with major restructuring. This move was initiated by an external environment factor in the form of a directive emanating from the Renault / Nissan Global Revival Plan. A number of incumbent Directors were removed from their positions either being sent back to Japan or put into other non-Director positions. A number of general and senior managers were also affected by this change. The result of the change was that a cross transfer of responsibilities took place and the Business Plans of certain divisions were taken over by new incumbents to these positions. The result of this change was not the chaos that previously would have been anticipated before the introduction of a formal framework that had been developed through the introduction of the NPMS. In fact no dramatic effect on the actual performance results of the organisation's business plans were experienced. This led to the belief that the standardised approach to both activity planning and Hoshin Kanri cascading was finally showing some degree of effectiveness. The Executive Vice President had set the focus of action on the activity plan of each layer in the organisation and these activity plans had remained in place through the re-alignment activity. The most significant result to be analysed at the end of December 1999 was that of the engineering department. The previous incumbent Director returned to Japan and the subordinate General Manager was appointed to the position of Vice President Engineering. The new incumbent to the position was able to continue using his previous Business Plan with only minor adjustment to be able to accommodate the Executive Vice President's overall target. By December most of the Control Item targets had been achieved with a strong improvement on the focused cost issues, refer to Appendix 15. The head of the Quality Assurance division was also recalled back to Japan and a General Manager was appointed into that position in the form of a Vice President of Quality. Analyses of the Warranty performance results was made and for the first time in the history of the Company the actual results came below the target level, refer to Appendix 16. The team approach that had been adopted through the Engineering business plan activity plus the Quality assurance activity had identified some of the root cause effects on the Warranty performance.

4.4.5 Testing the results

After the first six months of the 1999/2000 Business Plan year a number of results had been tested in terms of the business plan targets. According to the NPMS Matrix diagram shown in Chapter Two, Figure 2.4, there was a strong correlation between achieving QCD results and the development of the management plan through the step up of policy management. By December 1999 the NPMS in NSA had reached an achievement rate of 3.95, which was achieved against a target of 4.0. These results in terms of the NPMS step-up diagnosis, details of which were discussed by Harding (1999), were to be later verified by an independent Japanese auditor in May 2000. The more focused results relating to direct labour cost and straight ratio of production units were more of a concern as shown in the Trim and Mechanical business plan review matrix shown in Appendix 17. The Product Satisfaction Index (PSI) report issued by an independent marketing company shown in appendix 18 a and b, indicated that there has been significant improvement in NSA's quality performance, as viewed by the customer, over the past twelve month period. This report showed the Nissan One ton bakkie to be first and second in class in two of the LVD vehicle categories. This reflected particularly in the functional dynamic aspect where the focus of action had been in the engineering section. In terms of the adherence to a Standardised approach, internal audit revealed that there was now more consistency in terms of rigidly working to the laid down system in the plant.

4.4.6 Reflection on the issue at hand

A single loop learning approach revealed that the focus of action had returned some of the improvement results expected. The new activities that have been introduced by the new EVP and a large amount of specialist Japanese support, that had been made available to NSA, had helped to put the process in place. The actions of the South African management and their focus on activity plans had contributed to the constancy of purpose being developed to a fair degree through the business plan development process. Despite these attentions some of the results

in terms of Cost and Delivery were not achieved, although significant progress was made in terms of quality performance. Although cost activities were not the major part of the focus given in this cycle of action learning, the EVP's overall cost target also was not achieved in the first six months. The effect of restructuring did not cause any major devastation as was predicted by the people involved negatively, if anything the leaner operation brought about a renewed team spirit to try to succeed. Harding (1999) pointed out that NSA does not have the time available to wait for an economic turnaround in South Africa before improving its cost effectiveness. This message was well accepted by most of the NSA Manufacturing personnel who were in the main happy to accept the challenge of restructuring. A double loop learning approach revealed that external influences in terms of the Global Renault/Nissan alliance had a major impact on the organisation. This indicated that personal governing values or that of the micro organisation might often be negated by outside influences. This supports the view taken of the VSM model as discussed by Beer (1985) where the external environment has to be monitored constantly.

4.5 Conclusion

This chapter has focused on changing the management approach within Nissan South Africa to move towards a constancy of purpose as supported by Deming (1982). The Hoshin Kanri method as used with the NPMS as an improvement tool has been utilised to achieve this. The claim that an element of fear is preventing the organisation from reaching its potential has been investigated and the outcome of the EVP's Top Sindan audits has helped to remove some of this fear. The restructuring of meetings at senior level has had some effect on improved results in terms of Quality, Delivery and Cost issues. Not enough has been done at the end of the mid term period of the 1999/2000 Business Plan period to say that a major breakthrough has occurred. There has been sufficient improvement, however, to anticipate that a continued focus on delivery and cost issues through the development of more meaningful activities will achieve the desired Quality and Productivity performance levels.

CHAPTER FIVE

THE THIRD CYCLE OF ACTION LEARNING, JANUARY 2000 TO JUNE 2000

5.1 Reflection of revised actions of senior management

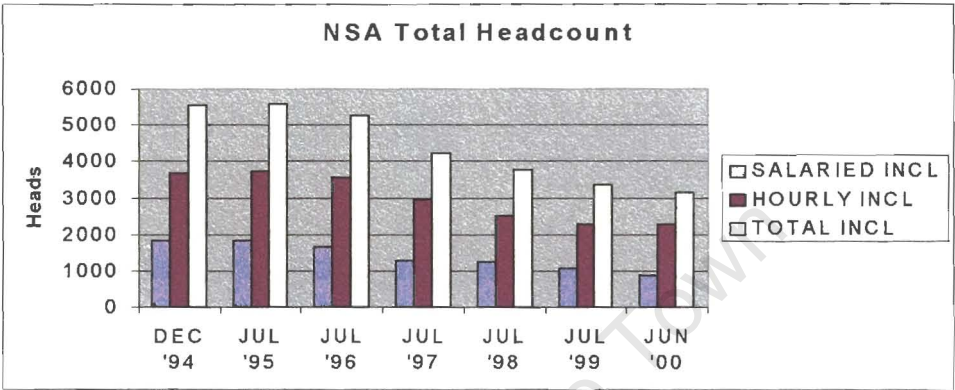
The revised focus of action, to pay more attention to the 'real' shop floor situation, from the various levels of management at NSA during the latter part of 1999, had achieved some desired results. The improved quality level of reaching the number one Product Satisfaction Index (PSI) rating had been achieved on the QW Hardbody, the Nissan focus model. The effect of the restructuring programme also had the result of a re-aligned top management structure that were prepared to work more together in harmony as a team. This led to a certain amount of residual fear being removed from the organisation. Deming (1982) states "*No one can put in his best performance unless he feels secure. Secure means without fear, not afraid to express ideas, not afraid to ask questions. Fear takes on many faces. A common denominator of fear in any form, anywhere, is loss from impaired performance and padded figures.*" The new top management team began to focus even more on the shop floor activities and spend less time in executive meetings. The meetings that were held were discussing accurate data and not the padded figures that Deming (1982) warns about.

5.1.1 Reducing the headcount and increasing productivity and quality levels

With the rationalisation of NSA salaried staff, whose numbers had halved from December 1994 to June 2000, refer Figure 5.1, it became necessary for the Japanese to give more direct assistance in the change programme. The headcount reduction was in line with the benchmarks of Nissan overseas operations. This was part of the Globalisation process which was using the NPMS support

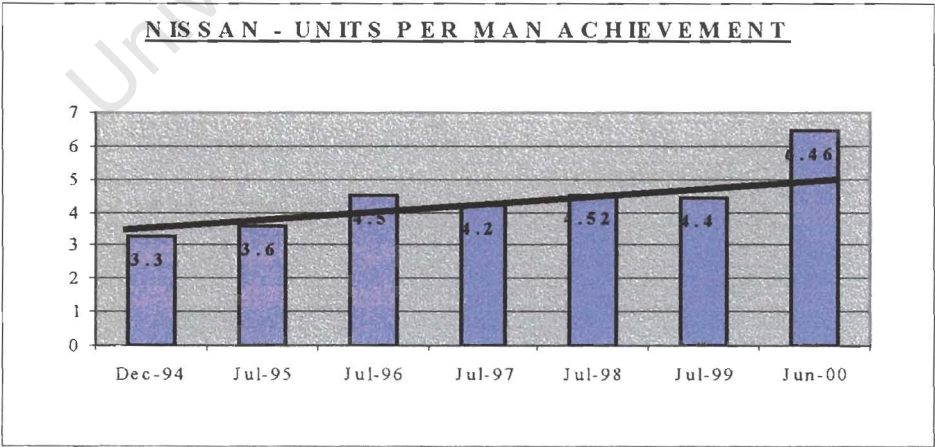
documents as the base for determining, not only standards of work, but also headcount ratios to complete the work based on volume and model mix. Figure 5.1 NSA Total headcount shows graphically the reduction of salaried and hourly employees over the period from December 1994 to June 2000.

Figure 5.1 NSA Headcount 1994-2000



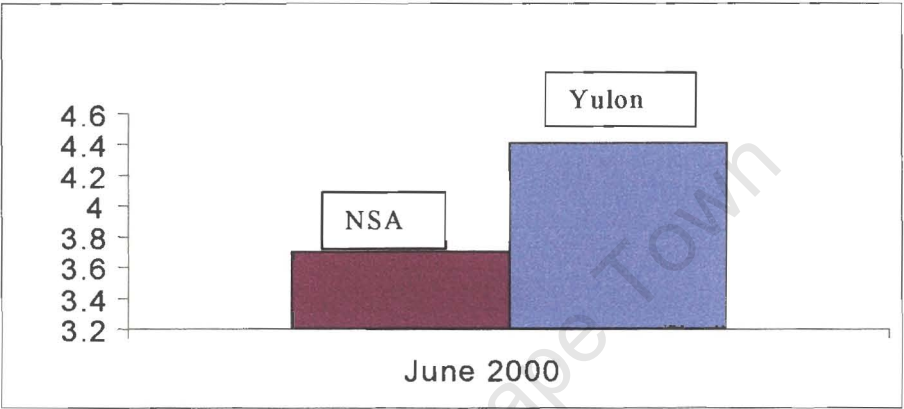
The continuing reduction of direct labour linked to the increase in volume had the desired effect of improving productivity at NSA in terms of Units per Man per Month achievement, which is the generally accepted measure in the International Automotive industry, refer to Figure 5.2. Units per man per month.

Figure 5.2 Units per man per month



The results indicated in Figure 5.2 show that the productivity trend was relatively smooth up to July 1999. The revised focus of action on activities supporting the 1999/2000 business plan, which included Units / Man / Month improvement, resulted in a more dramatic growth over the final twelve month period. This is shown in Figure 5.2 with the June 2000 result well above the trend line.

Figure 5.3 Comparison of VES shipping demerits between NSA and Yulon



If the quality trend, in terms of VES shipping demerits, shown in Figure 5.3, is compared with Yulon Motors result, it can also be seen that there was a favourable result in June 2000. This improvement in shipping quality was supported by the improvement in the Quality functional step up diagnosis score from 0.5 to a score of 3.0 as shown in Table 5.1 GK Step up score.

5.1.2 The continuing need to drive out fear

The Globalisation of NSA in terms of benchmark results was now bringing NSA closer to other overseas countries and in some instances NSA were now outperforming some of their traditional benchmark partners. This activity however also brought some problems to the company. A perception was being developed that headcount reductions were seen as the main focus of the Globalisation programme. The Cost per Unit measurement was becoming a main driver by the Japanese head office and the motivation of the workforce did not

appear to be initially taken into account. The rationalisation of headcount was also occurring in Japan but the culture of the NML companies accepted rationalisation as a necessary development for the future survival of the global business. Melnyk and Denzler (1996) speak of the many older Japanese executives who recall the harsh conditions of the post World War Two era. Those conditions spawned social contracts based on corporate unions' acceptance that worker's wages depended on the wellbeing of the firm. Wickens (1987) talks about the Japanese worker who accepts that it is sometimes necessary for him to be moved within his company or to a subsidiary and that such moves are necessary to meet a changing economic or market situation. It was, therefore, not always simple to compare productivity metrics without taking a holistic view of the culture of the organisations that were being used as the benchmark. The re-alignment programme had succeeded in reducing the employee numbers closer to benchmark requirements as indicated in Figure 5.1, Nissan Headcount 1994-2000. There was concern, however, on the shop floor with foreman to operator ratios, in some instances, one foreman to forty-eight operators, this being significantly below the benchmark norm of one to fifteen in Japan. This salaried staff headcount reduction left some serious fears in the NSA operation, particularly in the production and engineering support areas. Deming (1982) acknowledged this type of scenario and elaborated on his reason for driving out fear when he stated some actual expressions of fear as follows:

- *I am afraid I may lose my job because the company will go out of business.*
- *If I did what is best for the company, long term, I'd have to shut down production for a while for repairs and overhaul. My daily report on production would take a nosedive and I'd be out of a job.*
- *My boss believes in fear. How can he manage his people if they don't hold him in awe? Management is punitive.*
- *I'd like to understand better the reasons for some of the company's procedures, but I don't dare to ask about them.*

- *We mistrust the management. We can't believe their answers when we ask why we do it this way. The management has a reason, but they don't tell us.*
- *I don't have time to take a careful look at my work. I must turn this job out, and start on another one (engineer).*

A lot of the above statements quoted from Deming (1982) were closely related to some typical reactions from the NSA workforce overheard in the canteen and noted in the daily log of the author following the re-alignment programme. A further cause for concern was the high percentage of engineers who had resigned from the company since the re-alignment programme.

5.1.3 Creating the suitable atmosphere to make the organisation energetic

The foundation of the NPMS states (refer Figure 1.1 Section one) that the suitable atmosphere must be created to make the organisation energetic. This supports Deming's (1982) belief that an organisation cannot perform at optimum levels when fear exists. A visiting Japanese senior manager discussed the labour related concerns of the workforce with NSA management in May 2000. In a report issued to management he highlighted a number of suggestions to be considered at NSA, as seen from a Japanese perspective. A summary of these suggestions follows:

- Enrich the periodical meeting between Company and Union
- Consult a specialist about the labour problems
- Educate and train the Manager and Foreman about the correct way of Industrial relations.
- Inform the company plan and events in the morning meeting and aim to enhance the realisation of operators.
- Respect the position of shop steward.

The fourth point made about sharing information in the morning meeting is an important part of the Nissan culture. Wickens (1987) discussed the importance of communication and stated that *“Nissan managers at NMUK developed a philosophy statement aimed at building an effective company in which all are working towards the same aims and objectives.”* The philosophy statement includes:

- *We will develop and expand the contribution of all staff by strongly emphasising training and the expansion of everyone's capabilities*
- *We seek to delegate and involve staff in discussion and decision making, particularly in those areas in which they can effectively contribute so that all may participate in the effective running of NMUK.*
- *Within the bounds of commercial confidentiality we would like everyone to know what is happening in our company, how we are performing and what we plan.*
- *We want information and views to flow freely upward, downward and across our company.*

Wickens (1987) went on to say that in Nissan UK, *“if there is one aspect to be singled out as important in team building and commitment, it is the five-minute meeting at the start of day. These talks are frequently about quality but they are also used to discuss schedule changes, work redistribution, process changes or training. Most of the discussion is about matters that will affect the team in their daily work.”* Nissan South Africa recognised the importance of communicating concerns of mutual interest, particularly on quality concerns and created the 7h30 Morning Quality Meeting back in 1993. In its early stages, this meeting developed a reputation as a forum for criticism but in the early part of 2000 it took on a more positive role as a communication forum. The failure to meet targets was central to this morning feedback session but unlike early attempts to focus on the failure of the operator or foreman to achieve each targeted result, the meeting began to focus more on specific process improvement plans.

5.1.4 The need for a culture change

In order to gain long term benefit from the re-alignment of the organisation it was necessary to work on a culture change at NSA. Dale (1994) discusses the introduction of a Total Quality Management programme and says, *“the change of culture must be planned to avoid ambiguity and facilitate improvement and that managers must learn to lead change.”* He says *“culture change must be recognised as ongoing, rather than the prerequisite for TQM.”* The Nissan Way through the NPMS application methodology and the TQM philosophies has many common characteristics and Dale’s comments would also apply to NSA.

According to Deming (1993) after transformation, the manager of people will have the following fourteen roles.

- a. Manager understands and conveys the meaning of a system.
- b. He helps his people to see themselves as components of the system.
- c. He recognises and accommodates individual differences.
- d. He encourages his people to study and to grow.
- e. He is a coach and counsel, not a judge.
- f. He understands the interaction between people and circumstances that they work in. He recognises that workers that can learn a skill will come to a stable state – upon which further lessons will not bring improvement of performance.
- g. He has three sources of power.
 - Authority of office (Positional power)
 - Knowledge
 - Personality and persuasive power (Personal power)
- h. He will study results with the aim to improve his performance as manager of people.
- i. He will try to discover whom if anybody is outside the system, in need of help.
- j. He creates an environment that encourages trust (freedom and innovation).
- k. He does not expect perfection.

- l. He listens and learns without passing judgement on him that he listens to.
- m. He will hold spontaneous meetings (at least once per year) with all his people to establish their aims, hopes and fears.
- n. He understands the benefits of and losses from competition between people and between groups.

The EVP of NSA through his Top Sindan audits was able to assess the feeling of senior management as well as subordinates and how well they were progressing with the implementation of Business Plans. The EVP pocessed most of the characteristics as displayed in Deming’s points a-n shown above and was able to use these characteristics during his Top Sindan audits. These regular audits not only gave him the opportunity to assess progress of targets but also to gain a feeling of the prevailing mood of the staff.

5.1.5 Management interaction with the foreman

Through monitoring each foreman by using the Genba Kanri (GK) step up method, which is a sub element of the NPMS methodology, it became apparent that many foremen did not have the experience and training to control the shop floor to the standard required by the Japanese.

Table 5.1 GK Step up score

Diagnosis Item	Result	1	2	3	4	5
Floor management techniques	3.5					
5S activity and Safety	4.5					
Standard operating sheet	2.5					
Skill training	3.5					
Job allocation	3.0					
Quality assurance	3.0					
Autonomous maintenance	2.0					
Kaizen activity	3.5					
Total score	3.2					

The required capability level of a Japanese foreman would be a minimum of four steps as shown in each category in Table 5.1 above. In May 2000 the Japan based senior auditor of the NPMS reviewed the shopfloor performance at NSA. Although it can be seen from Table 5.1 that good progress had been made since the previous assessment in March 1998, there were many areas not reaching the level of four. Some areas had made good progress. The Quality Assurance segment had moved from a previous score of 0.5 indicated by the light blue line, to a score of 3 indicated by the black line. This system of shop floor management (GK) had been in use at NSA for more than ten years but it was only after the line management involvement of new Japanese GK advisors in 1999 that the actual methodology was explained to a satisfactory level. After the realignment of the company in November 1999 the responsibility for monitoring and teaching GK methods moved from the Human Resources Development to Management at the NPMS office. This responsibility then became a business plan target and senior management monitored the results. With this move the activity became less of a classroom training issue and more involvement was made on the actual shop floor and also in each green area. These green areas (Communication centres) became the focal point for monitoring each result. Model areas were developed in departments such as the paint shop and body shop and one to one coaching was given, particularly on autonomous maintenance and Standard Operation Sheet development that were seen as weak issues.

5.2 Developing the plan of activities for the focus of action at the shopfloor through the matrix board

The framework shown in Section Four Figure 4.1 was used again to identify the new issues in order to improve the shop floor performance in terms of QCD result. Management seemed to have underestimated one of the basic principles that Deming (1982) had highlighted which was his fifth point. This said, *"Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs."* In his elaboration of this

point Deming (1982) speaks about the improvement of the process including better allocation of human effort. *“It includes selection of people, their placement, their training, to give everyone, including production workers, a chance to advance their learning and to contribute the best of their talents. It means removal of barriers to pride of workmanship both for production workers and for management and engineers.”* A new assumption was developed towards the middle of the year 2000. Senior management had become more efficient at analysing information. Spreadsheets were produced faster and faster and information was distributed even quicker through the Internet and Intranet. All this was happening in the office environment and although more time was being spent on the shop floor the actual full daily performance picture was not visible. The foreman and operators had become isolated in the information technology age, which had been embraced by Management and Engineers.

5.2.1 Identify the new issue

A new issue was identified that the real concerns affecting quality and productivity at the shop floor went through too many filters. There were many teams of people working on numerous corrective action programmes. Engineers, foremen, managers were all busy solving problems or fighting fires but in the meantime the operator was left to continue his work with often little support. The issue was how could all the tasks being performed on any one day be brought together to establish whether the process was under control.

5.2.2 Involve the team

It was necessary to involve all the support areas that were involved with the monitoring and support of each process as well as the production superintendent and managers supervising the process. Various enquiry methods and frameworks were being used daily to monitor quality and productivity performance. A lot of

technology was used to create reports or conduct analysis and much data were available. This data was broken down into main categories as follows:

- Causes of line stoppages.
- Drifting out of workstation by operator.
- Effectiveness of Standard Operating Sheet.
- The skill level of each operator by task.
- The need and ability of each operator to confirm his task to specification.
- Items being damaged between known stations.
- Defects causing product to be side-tracked.
- The identification of critical processes for safety control.
- Known static quality outflow concerns.
- Known dynamic quality concerns.

Most of these data were being generated to management forums but little of it was finding its way back to source, that is the operator who was involved in performing the actual work at the actual work station.

5.2.3 Creating a clear picture

A clear picture needed to be created to put together all of the concerns that were affecting smooth production and preventing high quality, to the targets being set. Although a clear picture can be used in a metaphorical sense, what was really needed was a picture that each operator, foreman, Supervisor, Manager and support engineer could see. This led to the idea of creating a Matrix Board on the shop floor. A physical board was erected at the end of each production line and each item mentioned in section 5.2.2 was displayed. This display was related to an actual operator performing an actual task in a specific workstation. By collectively displaying all the tasks together it soon became obvious where the real concerns lay. The information was updated on a minute by minute basis so that any concern could be followed up within a short time of the concern being recognised. Steel tags were produced that could be hung on small hooks against each operator depicting the nature of each concern. All tags were colour coded

5.2.4 Going deeper

Figure 5.4 shows that a complex set of data emanates from the product realisation process. Clemson (1984) considers this point and asks how management can handle this mass of variety. He suggests they may even close their eyes and ears and just ignore it. NSA addressed the output of this mass of data by applying a filter that would sift the relevant data that could be handled, from the mass of data that would be overwhelming for them. Although each operation could be identified from the Matrix Board in terms of an operator's function, each task was found to be too generic in terms of a group of activities, rather than a specific action, to focus on. Although management needed to understand where problems were being generated they had a dilemma in determining what actual operation sequence was generating what concern and what could be ignored and what was relevant. Management amplified the message to the shopfloor by identifying certain operations that they felt were important in terms of their Quality, Cost and Delivery objectives. These focus items were established by addressing which of the control items, that had been given to the shop floor to monitor and report, were actually not achieving their targets. These operations were then identified by means of hanging a special coloured tag next to an identified operation. An example of this was a specific customer complaint that was affecting the Product Satisfaction Index result that was below its targeted level. Management could then focus on that specific operation and daily follow up the corrective action plan. It was necessary to further identify the actual sequence of individual movements of each operator in order to assess the level of skill of each element of each process. By monitoring this action it was possible to determine the skill level of each operator performing an identified task and then address the human element of the concern if the skill level was causing a defect. At first the reaction from the first line supervision on the production line to this approach, was that the Matrix Board was an easy way of monitoring absentees, which was possible through the hanging of a red tag against the name of any operator absent for the day. This was not intended as a

punitive measure but rather to identify where a standby operator was working in place of a regular operator. After a period of time the use of the board to filter out unnecessary information became clearer. Care was taken by management to use this board in a positive way and not to revert back to a climate of fear that may prevent the matrix board from being used as a communication filter and amplifier.

5.2.5 Establishing probable outcomes

Business Plans had been set at the beginning of the 1999 / 2000 business plan year focusing on quality, cost and delivery issues. Each level in the organisation, from the EVP down to the foreman level, had been given specific target values by which they could monitor the result. The Hoshin Kanri method was used to cascade the action plans to shopfloor level. It was now anticipated that by focusing on each operation on the shop floor where the actual work is being performed, each target would be easier to track and actual data collected. Metrics such as defect outflow from each process side-tracks from each process and secondary damage caused in each process would collectively make up the broad improvement activity. Defect outflow performance from each section was collected and the results displayed in each green area. Meaningful targets could then be set by each foreman based on actual improvement activity, rather than a wish to improve to a target set by senior management.

5.3 Monitoring the behaviour through green areas

Green areas or communication centres as depicted in Figure 5.4 are now being used as a forum to feedback each day's concerns directly to the operator. Appendix 19A and 19B indicate the opportunity for two-way feedback at each Green Area meeting at 7h00 each morning. The opinion of the operator is taken into account and any concern that he has experienced with facilities or processes can be addressed. This is now putting Deming's (1982) theories into place in a far more tangible way than previously attempted at NSA. It is anticipated that this

approach will yield further improved results which are already, in terms of quality, ahead of Yulon Motors, refer Figure 5.3 Section 5.1.1. This green area communication can now monitor performance by operator by task. If a defect slips through to audit inspection then the reason for the defect will be fed back directly to the operator. This can then be analysed and if necessary the Standard Operating Sheet (SOS) describing the task can be modified to help the operator eliminate the root cause of the defect. Collectively each recurring defect will then be assessed for permanent corrective and preventive action and the defect outflow performance will then be a standard monitor in each Green Area. This focus on the actual operation is working and results in terms of defect outflow are now at record low levels for NSA. The step up activity of GK is running parallel to the process improvement activity and the results of the GK step up is also displayed in the Green Area as a motivation to each foreman to successfully introduce the Japanese methodology. This is having a positive impact on the success of the quality and productivity performance and is also being used as a tool to connect the NPMS system and the results being achieved to each foreman.

5.3.1 Analysing the results

We can see from the NPMS map, referred to in figure 1.1 section one, that the first step is to establish a “clear indication of objectives and measures”. This statement is also qualified by saying that we must “renovate the old stereotype” which is implying that a paradigm shift is needed in setting new goals and objectives and achieving competitive targets. The Hoshin Kanri philosophy recognises that a management plan must be developed to achieve these new goals and objectives and this plan must be applied through out the organisation. This plan must be effective in that it crosses functional boundaries and has, as its major focus, Customer Satisfaction. The step up diagnosis prescribed by NML in Tokyo is an important aspect of the NPMS and all its constituent parts. The step up diagnosis is referring to the operational meaning of the NPMS that is aimed at improved Customer

Satisfaction, increased productivity and reduced waste as presented in the NPMS map. This can be summed up as follows:

- Create a policy decision based on Customer Satisfaction and changing needs.
- Development of that policy
- Develop a management plan to implement the policy that can be cascaded down to all levels.
- Check the plan and act on its implementation.
- Monitor the manufacturing shop floor where the real results happen.
- Take care of personnel and labour issues.
- Utilise production engineering and staff effectively.
- Ensure timely introduction of new model projects in order to stay in the race.

The Japanese appointed auditor from the NML head office measured the whole NPMS application at NSA in May 2000. The result of the audit is shown in Table 5.2 NPMS Step up result.

Table 5.2 NPMS Step up Result

Diagnosis item	Result	1	2	3	4	5
Policy decision and development	4.5					
Check and action	4.0					
3S activity	4.0					
Personnel principle	4.0					
Role of the foreman	3.5					
GK activity	4.0					
QRQC activity	4.5					
Kaizen activity	4.0					
Production Engineer C and J	4.5					
Productivity control	4.0					
Engineering development & Stds	4.0					
Total score	4.1					

The result of his audit showed that NSA was now compliant in terms of meeting the requirements for implementing the system as outlined in the above table 5.2, in that NSA had reached the level of 4.1 implementation score that is the NML certification level. The score shows that although the NSA Company as a whole achieved the recognised step up level of 4.1, the role of the foreman still needs attention. This improved role is being addressed through a comprehensive training programme the outcome of which can be assessed through the audit of the Matrix Board and green area communication centre.

5.3.2 Testing the results.

The overall NPMS score of 4.1 was now at the benchmark level of Taiwan. The impact of the NPMS as an improvement tool was now entrenched at management level and Business Plans were showing successful target achievement. The results emanating from the shop floor, however, reflected that the amount of side-tracks produced off the production line was still too high to warrant that the NSA system is yet at world class levels. The initial reaction to developing the matrix board to monitor performance had mixed results. One unexpected outcome was the sudden reduction of absentees in each area. This was attributed to the visual display of all latecomers and absentees by the placing of a red tag next to each name. This sudden reduction of poor attendance could be attributable to the fact that a fear factor still existed on the shop floor. The operators who were consistently absent were now concerned that their names were highlighted to senior management. This display, however, also had a positive effect in that the operators who were never absent were also being highlighted. Since the inception of these boards in June 2000, Quality of product off line is continuing to improve and can now be compared to other similar operations in the Nissan world. The outflow of defects into the final inspection line is reducing each month, as is the flow of defects from the paintshop.

5.4 Analysis of outcomes and reflection on final 1999 / 2000 results

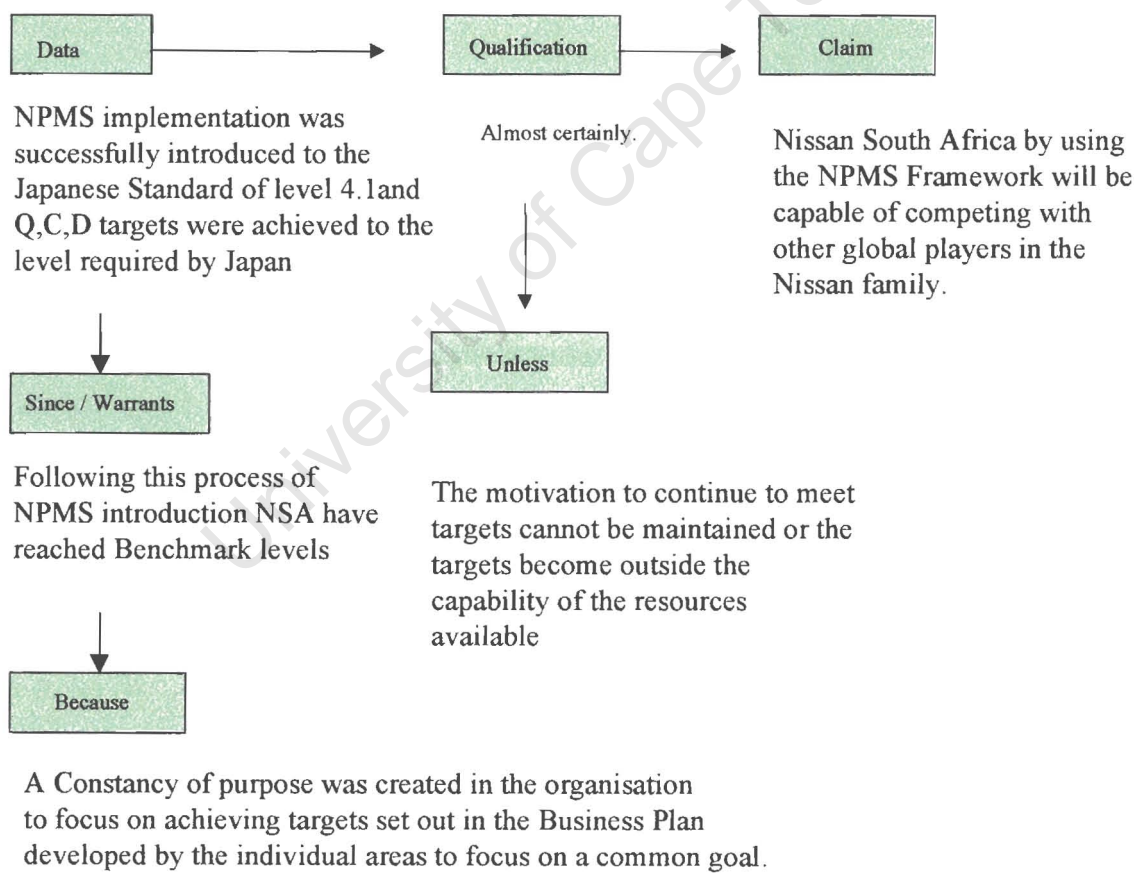
The final 1999 / 2000 business plan of the EVP of Nissan South Africa showed that for the first time in a number of years NSA produced an operating profit. Three Nissan vehicles achieved number one PSI status as best in class relating to Quality as perceived by the customer. Initial three-month warranty figures reached the target of below 0.35 defects per unit and this was the first time this target had been reached. Monthly into stock figures did not reach the target of 99% for the 1999 / 2000 Business Plan year only achieving 95%, but for the first two months of the 2000 / 2001 year there has been a 100% achievement. The international NPMS rating of step up four was achieved and this now means that NSA is no longer subject to third party audits from Japan on the application of the system. The results being presented at each monthly operations meeting are now showing the true picture of each division's performance. There are no longer distorted rates of success being presented. Each business plan item has been shared across each division by aligning targets through the use of tree diagrams. Individual results have not received the same focus as in previous plans with a higher focus on group activity.

5.5 Conclusion

The NPMS as an improvement tool has appeared to be successful. It has created a constancy of purpose as prescribed by Deming (1982). The Hoshin Kanri steps described in the NPMS were used as an implementation plan in order for NSA to achieve its Business Plan targets. The human issues have received more attention and the underlying fear recognised in the organisation at the start of the 1998 business plan year have mainly been dispelled. This is certainly true relating to the senior executive but at the shop floor level some fear still exists. The activities surrounding the PSI customer satisfaction index show that the focused team approach has been able to generate best in class results. . It has been proven that constancy of purpose developed by management and supervision has shown

improved Quality, Cost and Delivery results. As expected Deming's Theory of Knowledge did have a bearing on the outcomes of this implementation process. However, the organisation's management have not totally capitalised on his teachings that were partly responsible for the results achieved. The NSA operation will continue to remain viable if quality levels coupled with productivity improvements can be maintained and improved as explained in figure 5.5. Finally it can be concluded that the NPMS can lead to improvement of quality and productivity but the human factor must receive more attention if it is to work in this South African environment. The effect of the Renault / Nissan merger will still impact on the organisation but it is anticipated that the effect will be positive.

Figure 5.5 Final claim



CHAPTER SIX

REFLECTION ON THE ACTION LEARNING PROCESS

6.1 Using the NPMS as an improvement tool

This thesis has attempted to recognize, understand and overcome the pitfalls in trying to implement the continuous productivity improvement concept behind the Global Nissan Way philosophy. Focus was given to the Nissan Plant Management System (NPMS) as a tool to improve quality and productivity in an atmosphere where fear had been a dominant phenomenon. The NPMS map, and its supporting methodologies, have been successfully adopted by Nissan South Africa (NSA) and has achieved a degree of success in reaching some of the international benchmark production standards in terms of quality, cost, delivery and management systems.

6.2 Driving out fear

It has been suggested that before being able to successfully introduce the Nissan Way concept into South Africa, the eighth of Deming's (1982) fourteen points of 'Driving out fear in the workplace', must be accomplished. This point was not proven beyond doubt but it is suggested that the level of fear has been greatly reduced. This was accomplished by analysing the foundation of the NPMS Map, which states that "A suitable atmosphere must be created to make the organisation energetic" and it was suggested that an improvement was accomplished by greater involvement by senior management on the shop floor. This involvement has appeared to give senior management greater credibility which has been earned through respect and not fear. The Japanese rely on self-motivation at shopfloor level to make the NPMS methodology work effectively. In the culture of South Africa this self-motivation is not as apparent as it is in the East. With this in mind it is recommended that more attention be given to the motivation of the individual before trying to force the methodology onto the foreman. Training programs have commenced at NSA for the foreman but direct contact through overseas visits are

recommended for foremen from South Africa to see for themselves how the Japanese react to the challenge of setting tough objectives. Middle management at superintendent level also needs to take a more active role in developing standards and control items. The focus of the NPMS application has tended to be handled by senior management who have then looked at the foreman for applying the methodology and achieving the results.

6.3 Management involvement

By concentrating on the real concerns that were emanating from the actual production processes and by changing the focus of action and improved motivation on the shop floor most results have improved. The effect of the broad local external environment as well as the macro global environment was considered for its impact on accepting the system and it was recognised that the Renault/Nissan global alliance was a serious motivation for speeding up the change process. This change had the support of senior management and they were prepared to accept the international challenge. This challenge has led to the acceptance of responsibilities that may cross divisional boundaries but are in the best interests of the company as a whole.

6.4 Focusing on Constancy of Purpose

It was necessary for NSA to focus on constancy of purpose, as described by Deming, (1982) and this was achieved by the improved use of the Hoshin Kanri process. This ensured that the results of daily quality, cost and delivery performance continued to improve, as the focus of action on the actual performance activity became more detailed. This thesis has shown that further development work was necessary on the way that NPMS system was applied in order to overcome many pitfalls and achieve the desired result of improvement to international benchmarks. Harmony was created across divisions that led to the removal of some vested interests in favour of the group objectives.

6.5 Changing senior management's mental models

The main obstacles to the implementation process were overcome in particular the attitude of senior management to understand and accept the necessary change in management style. This difference of culture of South African executive management compared to their Japanese colleagues was considered, with particular focus being given to the interaction of management and the workplace. The mental models of each senior manager were changed as more exposure to the NPMS methodology took place with the realisation that the actual production process needed to be the focus of action.

6.6 The impact of Top Sindan audits

The impact of senior executive audits, referred to as Top Sindan by the Japanese was considered to be the main motivation for removing fear and encouraging self development and individual target setting at each layer of management right down to shop floor level. These audits were always conducted in a non-adversarial way that enabled each individual to have confidence to challenge each target.

6.7 Problem statement assumptions

The assumptions developed through the problem statement were analysed and the claim made was found to be substantially true. The strategy formulated as to how the NPMS could be effectively introduced into NSA and be accepted at all levels in the organisation seemed to have worked. This claim was supported in the fact that basic improvement items within each production area and also support functions, according to results collected, gave the desired result.

6.8 Using more meaningful objectives

The Hoshin Kanri process for the year 1999/2000, when compared to the previous business plan period, showed that more meaningful objectives were developed and

accomplished for NSA to meet its targets for improvement. This Hoshin Kanri process was used successfully to develop clear objectives for the company to meet most of its targets for improvement. Cross-pollination of objectives and control item targets were tested, through the use of tree diagrams in order to establish whether constancy of purpose as prescribed by Deming (1982) was achieved and this seemed to be proven.

6.9 Following the action learning process

The thesis followed the action learning process and the problem statement was tested at various stages in this process. Results of all the actions that were put in place were analysed and interpreted data was presented to support each claim that had been made. On reflection the proposed plan and anticipated results were mainly as predicted after following three action learning cycles over a period covering July 1998 to June 2000.

6.10 Achieving the results

The final modified activity by management and the revised Hoshin Kanri action plan achieved the desired results that were predicted in that Quality levels reached International benchmarks. The Company also returned to operating profit and delivery issues were finally brought under control in the first period of the current financial year. The company was officially given the recognition by Japan that it had successfully implemented the NPMS to the level desired. These achievements were made possible by a team approach to problem solving and control item setting. If this team approach can be cascaded to lower areas in the form of quality circle groups then the NPMS will have greater success at the shopfloor in terms of individual empowerment of the operators. Focus must also be given to the full implementation of the Genba Kanri shopfloor improvement training program. At the moment the training is not attending by all the foremen particularly those under pressure to perform their daily management duties.

6.11 Investigating alternative methods

Although the NPMS eventually achieved some form of success, other alternatives to achieve the same or even improved results could have been explored. The balanced score card is one option that could have been used as an alternate method. Robert Kaplan (1992) says *“What you measure is what you get”*. He goes on to say *“senior executives understand that their organization measurement system strongly effects the behavior of managers and employees.”* He also says that traditional financial performance measures may have worked well for the previous industrial era, but these measures are now out of step with skills and competencies companies are trying to master today. In many respects the balanced scorecard mirrors the ideals of the NPMS. Manas (1999) reports that while organizations continually seek more effective ways to change their cultural framework, refine their strategic direction and improve employee competencies, one constant remains, the best way to get a workforce’s attention about corporate focus is to link achievement of desired results directly to rewards. The NPMS introduction program at Nissan South Africa had not considered linking performance results to actual bonus payments. Management had pursued a self-motivation approach and although some favorable results were achieved it is doubtful that the improvements can be bettered or even maintained without some form of financial incentive linked to performance. One of Manas’s key findings from his research into the successful use of the balanced scorecard was:

- When linking the balanced scorecard to compensation, short-term incentives generally are seen as the most effective pay delivery tool for rewarding successful pursuit of balanced scorecard objectives.
- A strong link between balanced scorecard results and compensation will bring about more rapid and more robust change, because business and human resources strategies will be properly aligned.

Manas (1999) commented that compensation linkages should be made quickly and given real weight. He added that 13 of the 15 companies interviewed in his research were linking compensation to the balanced scorecard, making this an almost universal approach. He stated that the organizations interviewed stand to have between 25

percent and 33 percent of their total cash compensation opportunity affected by balanced scorecard results. Manas concluded that above all else, organisations that seek to implement the balanced scorecard approach and establish a link between results and compensation programs should remember that there is no “right way.”

6.12 Final conclusion

It has taken Nissan South Africa seven years to progress to being close to the level of other benchmark assembly operations outside of the big four overseas Nissan operations of UK, Spain, Mexico and the USA. It is strongly recommended that Nissan South Africa look at performance linked compensation if they want to progress to world class standards of productivity and quality as prescribed in the Nissan Way. Self motivation alone has not been enough to maintain competitive advantage in Japan and it is doubtful if the same system will be effective to the next level of performance in South Africa.

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