



Eletronuclear's Safety Culture Assessment and Enhancement Program

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Abstract. The present paper describes the Eletronuclear's safety culture assessment and enhancement program. The program was launched by the company's top management one year after the creation of Eletronuclear in 1997, from the merging of two companies with different organizational cultures, the design&engineering company Nuclen and the nuclear directorate of the Utility Furnas, Operator of the Angra1 NPP. The program consisted of an assessment performed internally in 1999 with the support and advice of the IAEA. This assessment, performed with the help of a survey, pooled about 80% of the company's employees. The overall result of the assessment was that a satisfactory level of safety culture existed; however, a number of points with a considerable margin for improvement were also identified. These points were mostly related with behavioural matters such as motivation, stress in the workplace, view of mistakes, handling of conflicts, and last but not least a view by a considerable number of employees that a conflict between safety and production might exist. An Action Plan was established by the company managers to tackle these weak points. This Plan was issued as company guideline by the company's Directorate. The subsequent step was to detail and implement the different actions of the Plan, which is the phase that we are at present. In the detailing of the Action Plan, special care was taken to sum up efforts, avoiding duplication of work or competition with already existing programs. In this process it was identified that the company had a considerable number of initiatives directly related to organizational and safety culture improvement, already operational. These initiatives have been integrated in the detailed Action Plan. A new assessment, for checking the effectiveness of the undertaken actions, is planned for 2003.

1. Introduction

The present paper describes the Eletronuclear's safety culture assessment and enhancement program. The company's top management initiated the program. The main motivation to start the referred program arose from the formation of the company Eletronuclear in 1997, from the merging of two companies with different organizational cultures, the design & engineering company Nuclen and the nuclear directorate of the Utility Furnas, Operator of the Angra1 NPP. The merger faced a strong opposition by the several workers unions. The merger process itself was complex, being stopped several times by court decisions. When the merger was finalized, Eletronuclear's top management was seriously concerned that the animosity resulting from the merger process could have spread throughout the company. Several immediate top down actions were taken, such as frequent meetings of the top management with the managerial level of the company, for discussion and establishment of the mission and goals of the new company; performance of managers training emphasizing teamwork; issuance of the company Quality Assurance policy; issuance of the company Nuclear Safety policy and initiation of a Safety culture self assessment program. This program, was conceived as an assessment to be developed internally by Eletronuclear, with the support and advice of the IAEA, to be followed by a safety culture enhancement program and a further assessment for checking the effectiveness of the adopted measures.

2. Eletronuclear's safety culture self-assessment

The conception and execution of the self-assessment phase of the program have already been described in references [1] and [2]. The main points of this work were:

- Obtaining support from the IAEA for program development, advice and supervision;
- setting up a multidisciplinary group with people from the different levels of the Company hierarchy, to conduct the work;
- Definition and agreement, by this group, of 22 safety culture categories, taking into account the situation of the new company (conflicts, organizational changes, cultural differences, etc.);
- Development of a survey instrument with 70 statements; a specific set of 2 to 5 statements was conceived for assessing each of the above mentioned safety culture categories;
- Application of the survey through a specific program;
- Collection and statistical treatment of the data;
- Evaluation of the results.

This assessment, performed with the help of the referred survey, pooled about 80% of the company's employees.

The overall result of the assessment, shown in Table I, was that a satisfactory level of safety culture existed in the new company. This result "per se" was not unexpected. Both companies, Furnas and Nuclen, were well acquainted with the concepts of INSAG-4 [3] for quite some time before the merger: the implementation of INSAG-4 recommendations was done as early as 1991 in the Furnas nuclear directorate and one of the INSAG-4 co-authors was Technical Division Manager at Nuclen. On the other hand a number of points with considerable margin for improvement were also identified in the assessment, as shown at the bottom half of Table I.

TABLE I. MAIN RESULTS OF THE SELF-ASSESSMENT PHASE

The self-assessment at ETN addressed 22 Safety Culture Categories. The overall assessment was "satisfactory" (67%), where "satisfactory" is defined as the range $75\% > X > 65\%$ of the safety culture oriented answers.

The 7 safety culture categories with the worst performance were the following,

- Motivation and Job Satisfaction (50%)
 - View of Mistakes (51%)
 - Absence of "Safety versus Production" conflict (51%)
 - Good working conditions with regard to Time Pressure, Workload, and Stress (57%).
 - Handling of Conflicts (59%)
 - Management of change (59%)
 - Organisational Learning (62%)
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It should be mentioned that some of the problems identified in the assessment, as presented in Table I, were already known to Eletronuclear top management, and actions were already initiated for their resolution. Some the activities resulting from these actions are listed in section 4 of this paper.

3. Safety culture action plan

The step following the evaluation of the results of the self assessment, was to establish an Action Plan for improvement of the identified weak points and have it formally approved by the company's Directorate. This Action Plan, in accordance with IAEA advice, was to address not more than 5 to 6 points and to be prepared by the company managers, the ultimate responsible for the Action Plan implementation. This was done in the first quarter of 2001, in a series of meetings involving the company managers at the Division and Department levels. One of the first joint decisions was to select the items to be improved bottom up, that means, the safety culture categories with the worst evaluation. The 5 selected categories are shown in bold in Table I above. The Action Plan was reviewed in a Safety Culture Seminar for Managers held by the IAEA, in June 2001, at Eletronuclear's premises. The resulting Eletronuclear's Action Plan is summarized in Table 2 below.

TABLE II. SUMMARY OF ELETRONUCLEAR'S MANAGERS ACTION PLAN

- **Motivation and Job Satisfaction (50%)**

Proposed Actions:

- a) Training Plan and Career Evolution Program.
 - Improve personnel evaluation system
 - Implement training for career evolution.
 - Implementation of Plan for employee education enhancement (participation in post-graduated, MSc and Doctorate programs).
- b) Managers development plan
 - Specific managerial skills training;
 - Safety Culture training;
 - Improvement of company communication;
 - Regular contacts of managers with directorate.
- c) Rewards
 - Implementation of bonus system for rewarding of individual performance.

- **View of Mistakes (51%)**

Proposed Actions:

- a) Development/ improvement of Plan for analysis of human errors with influence on plant safety;
 - Establishment/training of working groups for this purpose (emphasis on "understanding what happened").

- **Absence of "Safety versus Production" conflict (51%)**

Proposed Actions:

- a) Improvement of information on Safety Policy of the company
 - Training on Safety Culture fundamentals
 - Managers/employees monthly meetings to discuss examples of safety vs. production conflict either internal or external to their areas;
 - Training and information on Nuclear Safety subjects, and in particular on the company's Safety Policy through internal communication channels, information to new employees, courses, seminars etc.

- **Good working conditions with regard to time Pressure, workload, and stress (57%).**

Proposed Actions:

- a) Plan for reducing of stressing conditions at the work place
 - Improve definition of responsibilities, material and human resources planning;
 - Strategic long term planning for the individual areas and the company as a whole;
 - Re-evaluation of administrative routines and work processes.

- **Handling conflicts (59%).**

Proposed Actions:

- a) Training of managers in the techniques of conflict handling
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The above Action Plan was approved by the Directorate and formally issued as Company directive in July of 2001.

4. Detailing of the action plan

The subsequent step of the program was to detail the different actions of the Plan, which was done in close cooperation with the company managers. Insights derived from the IAEA Safety Culture Managers training Seminar referred above as well as from Ref. [4] were extensively used in the detailing of the Action Plan. In this detailing, special care was taken to sum up efforts and avoid duplication of work or competition with existing programs. This was particularly important considering the large number of initiatives, already operational in the company, directly related to the organizational and safety culture improvement categories of the Action Plan shown in Table II. Several of them were inherited from the mother companies, other were running in parallel with the program described in this paper, for example,

- Issuing of the Company Safety Culture Policy, based on INSAG-4 [3].
- Development of material and training on safety culture fundamentals at the Site;
- Employee performance evaluation and career program;
- Human performance training;
- Teamwork training;
- Organisational Culture Enhancement program;
- Several work processes assessment initiatives;
- Knowledge Management program;
- Development and use of safety and performance indicators,
- Evaluation of internal/external operating experience,
- Improvement of external/internal information program etc.

The integration of these initiatives in the detailed Action Plan was a natural decision. The detailed Action Plan was ready by end of September of 2001.

5. Implementation and follow up of the action plan

This is the present phase of the Eletronuclear's safety culture enhancement program. For every safety culture category of Table 2 there are actions in development, some new and some from activities previously in development. Every activity of the Action plan in development, is being continuously monitored and if necessary, modified in accordance to the received feedback.

The overall coordination, planning and follow up of these activities is being done by a team composed of four senior staff members from the Technical, Nuclear Operation and Administrative Directorates, respectively. The dissemination and follow up of the Action Plan activities within each Organizational Unit is performed by a designated safety culture facilitator. Presently, most of the Units have a facilitator; the goal is to have a facilitator for all Units in the Company. The pre-requisites set for the facilitators were that they should be preferentially front line supervisors, and most important, wanted to work with the subject of safety culture.

With the objective of harmonizing the knowledge throughout the company a concentrated training package with emphasis on safety culture fundamentals, is being conducted at Eletronuclear's Headquarters, where personnel, particularly from the non technical areas, has less acquaintance with the basic safety culture concepts.

Another activity to be highlighted refers to the local organization of the IAEA International Safety Culture conference to be held in Rio in December of 2002.

A new overall company safety culture assessment is planned for mid 2003. This will be an opportunity to compare the results with the ones obtained during the first safety culture self assessment. This will also permit to verify the adequacy of the measures being taken within the frame of the present Action Plan, and to modify them as needed.

REFERENCES

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