Quality and Safety Assurance for Maintenance Services

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Abstract

Although common to all kinds of businesses, quality and safety are the most important factors to consider, particularly the business of maintenance. Our key phrase for our policy in its quality control is "for customer peace of mind and satisfaction" and the key phrase for safety control policy is "safety is our top priority." In order to assure quality and safety, we are working on safety programs every day for service quality and safety. In maintenance-related businesses, focus on quality follows the priority for safety. For safety assurance, a variety of approaches have to be considered as safety can be assured only after many essential factors have been investigated, such as the examination of risks in preliminary planning, measures taken in practical work, education and training, activities for occupational safety and health, domestic regulations, and measures taken for troubleshooting. The most important factor is that we have to constantly take measures in order to attain basic safety and make ourselves ready to take appropriate actions.

1 Preface

In the business of maintenance, there are four words of management, i.e. Q (Quality), C (Cost), D (Delivery), and S (Safety) ("Q, C, D and S"). The fourth applies to safety control. Quality can be addressed only if safety has been assured; therefore, to assure quality, achievement of work safety is in the first priority. There is no specific remedy to ensure safe working conditions in all situations; therefore, for safety assurance, it is necessary to be prepared to use a variety of useful measures for various circumstances.

This paper introduces our multilateral activities and perspective regarding safety and ensuring quality.

2 Safety and Quality System

We offer services of supervision and advice to the engineering business unit conducting maintenance by sending dedicated staff members with expertise on quality and safety to our business sites across Japan. To be specific, their tasks are to check construction plans, implement project site safety patrol, and implement the program of occupational safety and health, etc. We monitor and manage safety and health programs from Tokyo, thus we are able to keep uniformed control across Japan. In this way, maintenance service quality and assurance of safety are secured.

3 Ensuring Real Safety

The most assured and important point to consider is to find ways to avert or reduce risks from a hazard and ensure real safety. "Real safety" means that safety can still be secured even though a wrong method or incorrect use of a method occurs; it has the same meaning as "failsafe." When one considers a countermeasure against the source of a hazard, for example, one may think of using personal protective equipment/gear. However, depending solely on the use of personal protective gear does not automatically lead to real safety. Making reference to paragraph 4.3.1 "Hazard identification, risk assessment, and determining controls" of the Occupation Safety and Health Management System (OSHMS 18001: 2007), we make it a rule to take measures in the order of "elimination," "substitution," "scientific control method," "signage/warning and/or management by directives," and "personal protective gear."

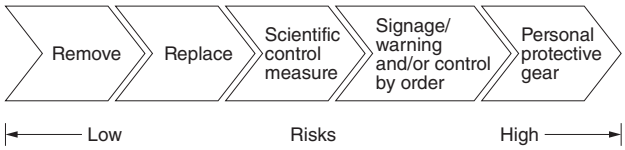

Fig. 1 Risk Reduction Order

The most effective measure taken to reduce risks is eliminating the source of hazard. The use of personal protective equipment is the least means to depend upon.

Fig. 1 shows the risk reduction order.

The most effective means in securing real safety is by eliminating the source of the hazard. We have to adopt the mindset that protection by using personal protective gear should be the last resort taken. The risk assessment by way of the aforementioned is carried out at the time of the pre-construction period: the on-site construction planning stage.

4 Input Review

When an order for a new project is entered, the contents of the project and the site conditions are first reviewed as an input preview. In consideration of Q, C, D and S, we select a project supervisor with the right expertise. With due consideration to contract specification, construction schedule and project schedule, etc., the project supervisor will draw up the on-site construction schedule by assessing the level of risk.

5 Project Construction Planning

The project supervisor draws up a project schedule on-site with documented procedures, organization chart, etc.

In addition to an overall project schedule, the daily project schedule is required to include an action list of the day. Each completion of another step requires the clearance by an in-process inspection and the plan is required to articulate at what step in the process an inspection will be made.

According to the project construction schedule, the documented procedure shows operating items and test procedures to clarify the work procedure.

The organization chart shows each work team and the scope of work. Considering the job requirements, the project supervisor assigns the proper working staff members after checking their skill levels, experience, and qualifications.

6 Output Review

We conducted an output review by assembling project-related staff to check if the project construction plan (drafted by the project supervisor) is sufficient. The first evaluation is made to check if the supply units meet contract specifications and it also articulates existing problems. The assembled staff check for anything overlooked, an omission, or insufficient problem-checking in the “risk and measure” assessment. Necessary measures are taken prior to the actual work date on-site.

7 Work Instructions and Danger Prediction Activities (DPA)

On the working day, the project supervisor briefs the day’s work to the on-site workers: job contents, scope of work, procedures, roles, and rules to be followed at the project site. At that time, the project supervisor gives instructions and cautions points for each step in the job. In each group, workers conduct DPA based on the instructions and risk assessment with corresponding measures in the construction planning. Workers make a countermeasure plan by examining what kind of danger presents and where such a hidden danger lies at the project site prior to the start of the day’s work.

Work commences after the project supervisor has confirmed the viability of the established plan. In order to achieve real safety, what matters most in DPA and particular job instructions is for the project supervisor not to only imply that the staff should “exercise care···” Instead, precise instructions should be given and specific measures dictated as a course to follow.

A set of this DPA table, organization chart, process charts, and an on-site safety check list should be compiled in our original safety sheet (Fig. 2). It is to be displayed at the project site so that everybody can view this sheet all the time.

8 Education and Training

We have discussed our related initiatives in routine work above; daily safety programs are introduced below.

The safety measures taken during actual maintenance site work are the last of such safety gates and it is necessary to take part in daily safety initiatives so that each worker can perform, at the mini-

Fig. 2 Original Safety Sheet

Shown is the DPA table, organization chart, project schedule, and on-site safety check list.

Fig. 3 View of Training at Meiden Engineering Center

Actual machines and facilities are used for training at the Meiden Engineering Center.

mum, basic safety at all times.

For daily safety activities, education and training is required. In regard to education of basic matters relating to laws, regulations, standards, and rules, we conduct regular group trainings. At that time, it is preferable to classify the members attending the training course according to their acquired levels of proficiency. All service-related members are categorized by their group training and personal level of education appropriate by each Business Unit (BU) service in accordance with the level of skills and knowledge of each individual.

In group training, we provide new employee education for new recruits, follow-up education for new recruits, education for project supervisors, and education for ISO management. We provide engineering training for specific products, and quality and safety education for each BU. As a training center, we have Meiden Engineering Center where not only educational lectures are provided, but which also has actual power machines and facilities for hands-on technical training. Fig. 3 shows a view of training at Meiden Engineering Center.

It is necessary to provide for not only regular education but also emergency response training. For example, there is a training exercise in the case of an accidental oil leakage. In addition to the above, there is legal training and specialized training for low- and high-voltage-applied product handling and according to on-site project-specific work requirements.

Scheduled education and training, coupled with the acquisition of knowledge necessary for basic operation can lead to a safe work environment.

9 Activities for Occupational Safety and Health

According to the size of a place of business, a Safety and Health Committee is a requirement because it is dictated by law. As part of the actions taken for occupational safety and health, we conduct patrols for safety, make proposals for safety, conduct case studies of near-miss cases, and provide workshop 2S program “Seiri” (Sort) and “Seiton” (Straighten), etc. At our company, these events are made highly visible so that not only are the number of activity cases displayed, but also the contents of actual events are presented so anybody at any time can reference them for the effective use of the programs.

As described above, activities for occupational safety and health are promoted daily for raising safety awareness. Fig. 4 shows a view of an Automated External Defibrillator (AED) training as part of occupational safety and health initiatives.

10 Effective Internal Rule Structuring

Official laws, regulations, rules, and ordinances are the most basic and minimal guidelines and do not serve in all cases. In order to secure quality and safety, we have to establish our own internal policies and procedures. Generally, any enterprise may stipulate its own internal regulations. Some of them, however, are simply a list of things prohibited. However, these rules need to depict an ideal situation conducted in right way. We make our internal guidelines based on this way of thinking.

Fig. 4 View of AED Training

In activities for occupational safety and health, AED training is carried out with the help of professional firefighters and industrial physicians.

11 Lessons form Past Defective Cases

For the prevention of a recurrence of an industrial accident and deficient work, it is necessary to investigate the possible causes of the occurrence of defects in order to determine the best way to trouble-shoot. In most cases, the measures tended to be temporary ones. We adopt an approach of the "why&why" method of analysis whenever any deficiency occurs. We try to find out the root cause by considering "management factors," "systematic factors," "mechanical factors," "environmental factors," and "personal factors" in order to find substantial measures to be taken. During the aforementioned training sessions, we review such cases of countermeasure. We have built a system which can retrieve data from past faulty cases. Using this system, we double check the past countermeasure against defects found during similar work. This check is effective in the prevention of reoccurrences.

12 Postscript

This paper introduced our activities to assure quality and safety. We are now promoting a project with a slogan to be "Japan's No.1 High Quality Maintenance Service Company." In this project, quality and safety are the most important goals. Going forward, we will work on further upgrading our programs to improve quality and safety.