

OSART Good Practices
MAINTENANCE
Conduct of maintenance work

Yonggwang, Korea, Rep. of

Mission Date; 16 Apr.-3 May, 2007

I&C surveillance tests (ST) have been significantly enhanced for quality of work and reduction of human error by having visual controls in place during the conduct of tests.

I&C technicians performing the ST wear a yellow jacket and post temporary signs at the entrance of the MCR to alert shift crews of the test taking place and to distinguish themselves from other operators. The person in charge of the test informs the deputy managers of OPS and MA of the test plan one day before the test so good preparations can be made. Before the test begins a sign is posted at the entrance of the MCR showing the details of the test and expected time it will take place. Controls are then put in place for entering the MCR to help operators focus on the test in progress. A good pre job briefing (PJB) is held to discuss the test details, cooperation with operations and any operating experiences. The shift supervisor then informs the shift crew of the results of the PJB. As noted above, testers wear yellow jackets to distinguish themselves from other operators and to be visible to all as testers.

Results: ST are very well planned and executed with improved controls for the prevention of human error.

System of diagnostics and monitoring of start-up characteristics of diesel generators of KhNPP unit 1 and 2.

Diesel run-in time required by Technical Specifications must not exceed 15 seconds. Prior to put diesel into scheduled maintenance, it is very important to evaluate operability of control elements circuit that have impact on the run-in time and to take corrective measures upon the necessity.

Since 2004 KhNPP has adopted and successfully implemented a system for diagnostics and monitoring of start-up characteristics of diesel generators of KhNPP to check the operability of start-up components.

A multi channel analyzer "REKON-08MC", manufactured by the Company "REKON", Donetsk, Ukraine, is connected to record and to analyze electrical signals from sensors and switching processes in relay circuits during diesel start-up. Analyzer has several functions of automatic starting-up; registration; archiving; storing and initial processing of registered data when lining down for maintenance and post maintenance testing;

The implementation of this analyzer has provided the following benefits:

- Additional control of diesel run-in time;
- Better quality monitoring of good condition of safety system elements and diesel as a whole; and
- Timely detection and elimination of malfunctions, including latent ones of certain components (relays, electrical start-up air operated valves, diesel breaker, etc.) that result in better availability of this system important to perform safety functions.

Mihama 3, Japan

Mission Date; 20 Jan.-5 Feb., 2009

Field supervisors conduct pre-job TBMs (tool box meetings) to give instructions on the day's work and reinforce safety, quality, and other precautions to workers.

A TBM is a field meeting for the workers of each job, called by the field supervisor before the job starts and when needed (lasts approx. 5 - 10 min.).

At a TBM, the field supervisor checks the workers and their physical conditions, as well as the working organization. The field supervisor also cites past non-conformances and accidents in reinforcing the procedures for important operations and key points of the work to all workers.

A part of the TBM is the use of "action tables of work-related hazards / harmful factors and requirements ("Action Tables" hereafter)", summarizing "hazards involved" for each work item, "rules" for each plant requirement, and "workplace accidents in similar work operations reported at KEPCO power stations over the last five years". The tables, compiled under the Occupational Health & Safety Management System, are distributed to all sections and all contractors.

The Action Tables must be kept at each of the workplaces. The constant accessibility of past accident information makes the tables a tool that significantly contributes to the prevention of workplace accidents.

Also, in daily TBM, persons in charge inform workers of hazards/harmful factors and rules listed in the Action Tables to refresh their knowledge. This increases the level of cautiousness among workers concerning the hazards/harmful factors involved in the day's work, thereby preventing workplace accidents. The practice also has the effect of preventing deviation from the days' work procedures and rules including laws.

St. Alban, France

Mission Date; 20 Sep.-6 Oct., 2010

Chain with magnetic ends for designating worksite.

A special user-friendly tool has been designed by the I&C team to mark electrical worksites using a plastic chain with magnetic ends. This system is simple, extremely quick to use, and it can be used in electrical rooms. Field workers simply "clip" the magnets to the relevant metallic electrical cabinet. Each chain also has a plasticized tag so all labelling requirements are met and the label can be rewritten when necessary. The walls of a room can be equipped with metal plates also.

The rapid installation of this system saves time and effort. It is not necessary to fetch supports and special marking tape. It also improves work site safety.

Armband on work leader.

The maintenance department are using a yellow armband to identify the work leader on site. This will point out the responsible person and may prevent some communication errors.

Advantages:

- Been in use since 2005 in green and 2009 new colour, yellow.
- Designation of the Work leader as the responsible person on site.
- Improved communication between professional groups at site with good results.
- Clear identification of responsible person for other interdisciplinary work groups.
- Improvement of safety, and error prevention due to clear exchange of information with work group leader.