

Electronic Field Procedures

Background

Westinghouse Electric Company has decades of experience in developing and successfully deploying computerized procedure systems in Main Control Rooms of nuclear power plants throughout the world.

Electronic Field Procedures include many of the same features and tools of the computerized procedure system; converted onto a mobile tablet. The field use of this technology creates a portable, powerful tool for operations, maintenance and engineering personnel.

This technology enables excellence in three key areas:

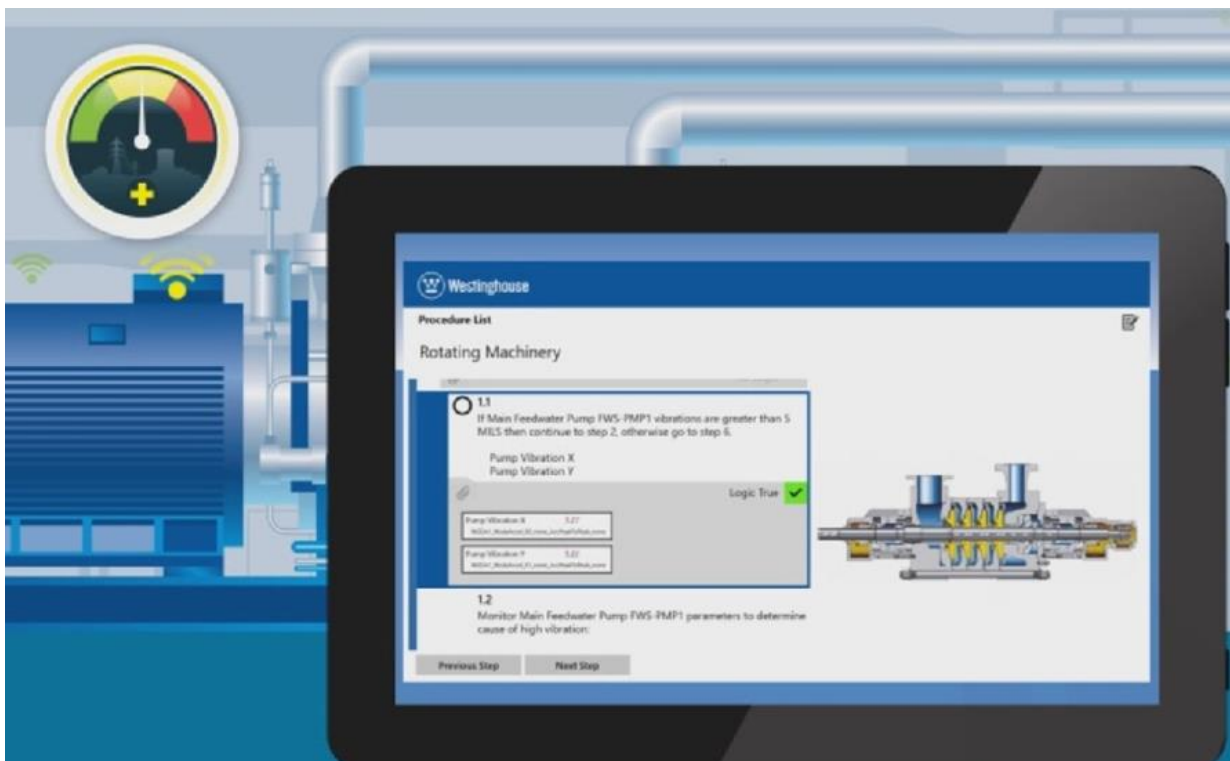
- Human Performance
- Supervisory Oversight
- Continuous Improvement

Description

Electronic Field Procedures enable station personnel to overcome complex human performance challenges through the use of embedded human performance tools. Cost savings are realized through the elimination of cumbersome paper procedures/processes leading to increased field efficiency.

The Procedure Dashboard feature provides real-time status of all procedures in progress. Station Management can evaluate critical path activities and gain early insights on challenges. These elements can be utilized simultaneously to provide a proactive approach that helps minimize schedule delays and improves outage performance.

To enhance future field work, procedure analytics enable the platform to evaluate actual field performance data for meaningful post-work evaluations and the creation of effective continuous improvement initiatives.



Capturing dynamic field data using a mobile tablet

Benefits

- Embeds human performance tools that alert users of erroneous data or data that requires subsequent action
- Automates data collection to support work performance and component analytics
- Eliminates the need for paper procedures
- Leverages existing distributed information systems to support improved work performance execution
- Automates notifications and requests
- Uses standardized technology for conformance to site wireless and cyber security protocols

Key Features

- Supports site-specific styles/formats
- Timestamps and logs each step
- Monitors real-time status of procedures in progress
- Performance analytics compares planned durations versus actual
- Supports on demand access to relevant references and operating experience

Experience

Westinghouse has over 50 years of experience providing products and services to the global nuclear power plant fleet including a complete range of applications such as protection systems, control systems, information & monitoring systems and operator training simulators.

The screenshot shows a Westinghouse procedure interface. At the top, there is a navigation bar with 'Procedure List', 'Overview', 'Pre-job', 'Tools', and 'References'. The main heading is 'DRAIN, CLEAN AND INSPECT MAIN FEEDPUMP TURBIN'. Below this, there is a text block stating: 'A SOP Permit is required for performance of the following work activities, that is, rotation of the spectacle flange. Verify the Permit has been "Accepted" and all parties working under this Permit have signed onto the Permit Sign-On/Sign-Off sheet.' Below the text is an 'Input' section with a 'Criteria Met' indicator and a checkbox for 'Permit has been "Accepted": True (selected) False'. Below the input section, there are two task instructions: '4.3 Rotate the spectacle flange downstream of check valve 2-LOS-V005 on line 2-LOS-V007 as follows:' and '4.3.1 Loosen spectacle flange bolts and rotate the spectacle orifice such that the "orifice side" is aligned with the system.' At the bottom, there are 'Previous Step' and 'Next Step' buttons.

Embedded Human Performance Tools

The screenshot shows a 'Procedure Status' dashboard. At the top, there is a navigation bar with 'Home', 'Procedure Status', 'Users', and 'Work Orders'. Below this is a table of active procedures:

Procedure ID	Procedure Name	Total Steps	User	Status	Current Step	Steps Completed	Planned Time	ETA
SCP-100	Plant Cooldown Mode 3 to Mode 5	571	George West	In-Progress	4.17.24	529	6 hours	3:34 7/9/18
RNS-101	Residual Heat Removal System Operation	113		Inactive				
CNS-008	Containment Entry	110	Sam Piro	In-Progress	2.4	11	4 hours	5:26 7/9/18
MPS-027	Main Feedwater Pump A Motor Replacement	337	Arnold Wilson	In-Progress	6.23.4	265	120 hours	2:03 7/10/18

Below the table is a 'Procedure Detail: Plant Cooldown Mode 3 to Mode 5' section. It includes a 'Procedure Print' button and a 'Detail Log' table:

Time	Type	Step	Details
7/9/18, 1:45 PM	Step Transition	4.17.17	From step 4.17.16 to 4.17.17
7/9/18, 1:46 PM	Step Transition	4.17.18	From step 4.17.17 to 4.17.18
7/9/18, 1:48 PM	Step Transition	4.17.19	From step 4.17.18 to 4.17.19
7/9/18, 1:49 PM	Step Transition	4.17.20	From step 4.17.19 to 4.17.20
7/9/18, 1:51 PM	Step Transition	4.17.21	From step 4.17.20 to 4.17.21
7/9/18, 1:51 PM	Step Transition	4.17.22	From step 4.17.21 to 4.17.22
7/9/18, 1:56 PM	Step Transition	4.17.23	From step 4.17.22 to 4.17.23
7/9/18, 1:58 PM	Step Transition	4.17.24	From step 4.17.23 to 4.17.24

To the right of the detail log is a progress chart showing the percentage of steps completed over time. The chart has a y-axis from 0% to 100% and an x-axis from 1 to 24. The legend indicates: Actual (blue line), Estimated (red line), Planned (green line), and Completed (orange bars).

Procedure Dashboard