

# OSART Good Practices

## OPERATIONS

### Work Control

#### Loviisa, Finland

Mission Date; 5-21 Mar., 2007

Computerized aid to shift supervisor to check technical specifications compliance before authorizing work permits.

The shift supervisor (SS) has the overall responsibility to ensure that the availability of safety system conforms to plant technical specifications at all times. Before authorizing any work permit, the SS must use primarily the technical specifications manual and his own knowledge.

To support the shift supervisor in the technical specifications conformance control, the LOMAX information system has the following convenient features:

- Component database specifies components related to technical specifications. When a technical specifications related new work request is introduced, it is notified and transferred to the shift supervisor for approval.
- LOMAX system also contains information on the redundant, parallel safety systems as well as information about power supplies and other support systems to the technical specifications related component. When the shift supervisor authorizes a work permit related to some safety system, the system will indicate, if there are already current faults or work orders in the other redundancy or parallel component. This feature ("cross fault checking") supports the shift supervisor in identifying these conditions.

This system provides a helpful support to the shift supervisor and permits to reduce the risk of error or omission when authorizing work permits related to components covered by technical specifications.

### Temporary Modification Review and Control

The station employs a cross-discipline review and ownership process regarding the control of Temporary Modifications (TMs). The identification and control of TMs is frequently reinforced and reviewed during operator shift turnovers, requalification training and daily management meetings. This is accomplished through:

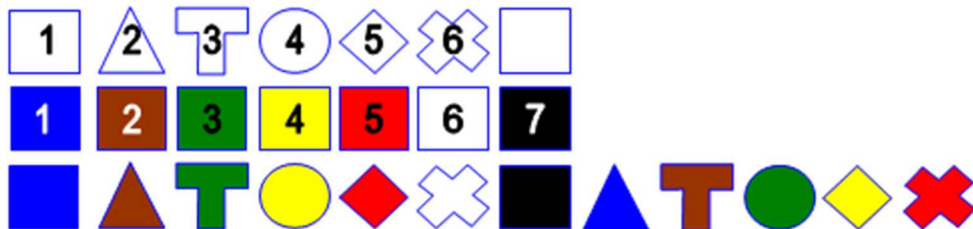
- Monthly audits of the TM log by Engineering and associated walkdowns to confirm proper implementation of current TMs and to verify that no unauthorized TMs are installed.
- The TM list and status is on a database, along with supporting analysis, and is included on the operator turnover sheets and discussed as a part of turnover for each SRO, RO and Equipment Operator.
- The temporary configuration change programme coordinator presents monthly status updates of installed TMs during the Plan of the Day meeting. This update includes the number of installed TMs, their installation date and their scheduled removal date – this provides a forum for senior leadership to challenge the removal dates.
- Operations Shift Management provides final approval of TMs prior to implementation and this ensures operations involvement in the overall review and authorization process.
- Approval of the site Vice President (VP) is necessary if a TM has to be installed for a duration greater than a refueling cycle.

The above verifies proper control of TMs and the restoration of station equipment to normal design following completion of the TM.

Colour coded symbols for identifying electrical panels on switchboards.

A system for identifying electrical panels on switch boards uses a shape/colour recognition symbol for each circuit. All the related doors and covers for each circuit are given a symbol that is different from neighbouring circuits. There are six shapes that are repeated in order. There are also seven colours that are repeated in order so that the first circuit is a blue square, on the seventh circuit the square is repeated but the colour is black. The next time the square is repeated it is a white square. Using this system the blue square is repeated every forty two circuits. Most switch boards have less than forty-two circuits. On the few occasions where there are more than forty-two circuits, they will be so far apart that it should be obvious that they are different circuits. The colour shape recognition symbols use six shapes and seven colours to produce 42 different symbols.

Picture of colour coded symbols



The plant has developed an algorithm to identify the smallest possible isolatable parts of the system (electrical, mechanical) and define boundary components for Clearance Orders.

**Purpose:** The Spill Over software is a safety feature that helps the Tagout Office staff to identify all the boundary components around the equipment to be repaired and moreover significantly speeds up the whole process of creating Clearance Orders. It is also an important tool to prevent human errors.

### Description:

Temelin NPP staff, create between 8000 and 10000 Clearance Orders and Model Clearance (model tag outs) Orders per year. Each Clearance Order can contain up to 700 steps, up to 2600 affected devices (internals) and up to 400 clearance requests (work order tasks) for the equipment under repair.

The proposed tagout can be done by manually selecting an element or a set of elements in the process diagram followed by the selection of a manipulation code or the Spill Over (software algorithm supporting tag outs) method.

Spill Over is a machine search algorithm for the smallest possible isolatable parts of the process (electrical, mechanical) and defines the boundary components of the Clearance Order, the components to be manipulated and the components inside the tagout area (internals/affected components) of the Clearance Order

### Benefits:

When creating the Clearance Order steps, the manipulation codes of the selected equipment on the service diagram are set. Manipulation codes are set by the spill function within the software, using a form, automatically or manually after the component is selected. The spill algorithm also electrically isolates the drives of the equipment being isolated.

As part of the new data processing, the clearance orders are validated. That means, checks are performed to ensure that clearance orders are based on valid process diagrams and that the design identification codes / designations used are the same revision as used when the clearance orders were created. Invalid clearance orders are marked as invalid.

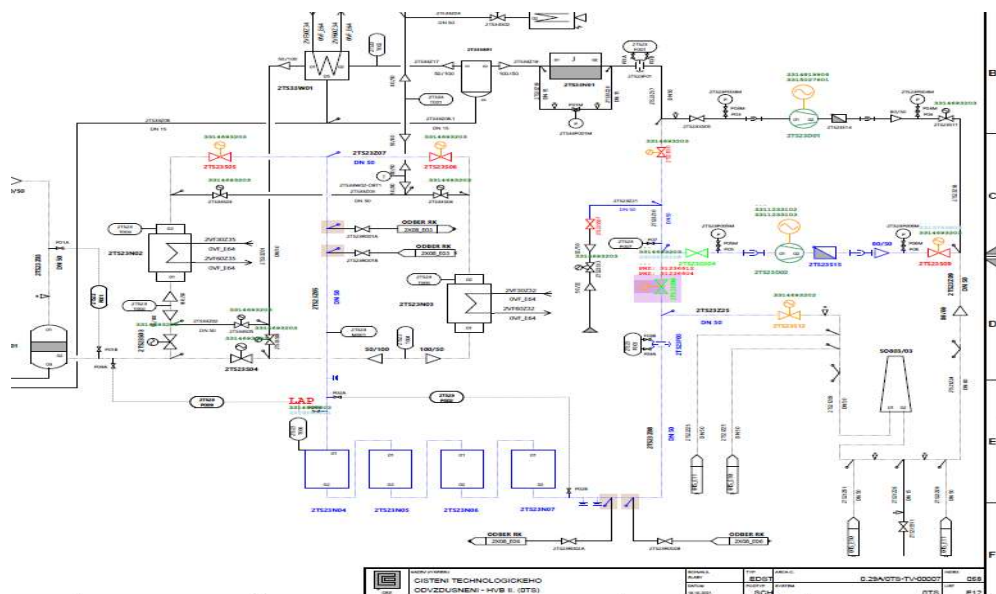


Fig.3: Example of the tagout spill function in the diagram