



ENGINEERING CHANGE PACKAGE TESTING AND MAINTENANCE PLANNING

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Standard Design Process

- Standard Design Process (SDP) Testing section is where we describe the required testing to verify the critical characteristics of the new design
- Past practices before SDP could involve detailed step by step instructions written by engineering for comprehensive post-modification testing (PMT)
- Past practices any change to the PMT through either plant conditions, implementer preferences or field issues would also cascade into an ECP revision

SDP Testing

Drivers are costs and engineering resources

- Reduced engineering cost for testing development

FCR's and revisions-simple Revision costs ~ \$10k

- engineering costs, planning, owner reviews, impacts, etc.

Emergent work

- short deadlines, increase potential for an error

Outage impact

- Mod Testing often occurs at the end of a system window or critical path

SDP Testing

Keep ECP testing to critical design elements
-not write a step by step test procedure

Testing Section should

- Focus on critical characteristics
- Tie back to FMEA
- Focus on special tests and not duplicate standard Post-Maintenance Test

SDP Testing

Most sites have a Post-Maintenance Testing manual

- engineering owns the technical content
- planning selects the applicable tests based on the work scope
- operations approves PMTs

SDP Testing

Post-Maintenance Testing procedure includes common methods to return a component

- in service leak test
- megger motor
- cable continuity check

These would not be included in the ECP Testing Section
Leverage the PMT manual for overall Return to Service

SDP Testing

Will require a change in behaviors

- Planning is accustomed to engineering provided deliverables
- Engineering is accustomed to accommodating

SDP Testing-Tools to Drive a Change

Design Review Meetings in IP-ENG-001 have required discussion points for Testing at each phase

- ensure engagement and discussion

TVA developed a flowchart

- outlines when source is PMT manual or ECP testing

- follows IP-ENG-001

Met with Modification (Implementers) and Maint Planning

- Explain the cost and man-hour drivers

SDP Testing

- Monitor ECP development
 - *Engineers will still do it the old way*
- Monitor Design Review Meetings
 - *Ensure engagement and discussions (Ops)*
- Monitor ECP comment resolutions
 - *Planners will make the comments to add it back in*
- Align to IP-ENG-001 and PMT manual

Planning

TVA uses work order restraints-Maximo work order hold

- identifies engineering hold

- could require ECP or Equivalency

TVA uses Engineering Work Requests to transmit information

- Non QA process

- Simple form with 2 engineers and a supervisor

Planning

Alternatives:

Cross-Discipline Review of Work Orders

-similar to procedure reviews

In-line approvals

Planning

- Breakout Sessions

Share best practices and challenges in

- ECP Testing
- Work Order Planning