



**Memorandum from the Office of the Inspector General**

May 24, 2019

Jacinda B. Woodward, LP 2K-C

**REQUEST FOR FINAL ACTION – EVALUATION 2018-15587 – COAL OPERATIONS’  
DESIGN CHANGE NOTICE PROCESS**

Attached is the subject final report for your review and final action. Your written comments, which addressed your management decision and actions planned or taken, have been included in the report. Please notify us when final action is complete. In accordance with the Inspector General Act of 1978, as amended, the Office of the Inspector General is required to report to Congress semiannually regarding evaluations that remain unresolved after 6 months from the date of report issuance.

If you have any questions or wish to discuss our findings, please contact Leslie A. Franks, Auditor, at (865) 633-7330 or E. David Willis, Director, Evaluations, at (865) 633-7376. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler  
Assistant Inspector General  
(Audits and Evaluations)  
WT 2C-K

LAF:FAJ

Attachment

cc (Attachment):

TVA Board of Directors  
Clifford L. Beach Jr., WT 7B-K  
Janet J. Brewer, WT 7C-K  
Robertson D. Dickens, WT 9C-K  
Dwain K. Lanier, MR 6D-C  
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OIG File No. 2018-15587



Office of the Inspector General

# *Evaluation Report*

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To the Senior Vice  
President, Power  
Operations

## **COAL OPERATIONS' DESIGN CHANGE NOTICE PROCESS**

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Evaluation Auditor  
Leslie A. Franks

Evaluation 2018-15587  
May 24, 2019

## **ABBREVIATIONS**

BSL	Business Support Library
CMDC	Configuration Management and Document Control
DCN	Design Change Notice
FES	Fossil Engineering Services
FPG	Fossil Power Group
IGA	Intergroup Agreement
PO	Power Operations
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority

**TABLE OF CONTENTS**

EXECUTIVE SUMMARY ..... i

BACKGROUND..... 1

OBJECTIVE, SCOPE, AND METHODOLOGY ..... 2

FINDINGS ..... 3

    DCNs GENERALLY IN COMPLIANCE WHEN PROCESS  
    WAS UTILIZED..... 3

    DCN PROCESS WAS NOT ALWAYS FOLLOWED ..... 4

    OPPORTUNITIES FOR IMPROVEMENT ..... 5

RECOMMENDATIONS ..... 8

**APPENDIX**

MEMORANDUM DATED MAY 22, 2019, FROM JACINDA B. WOODWARD  
TO DAVID P. WHEELER



# Evaluation 2018-15587 – Coal Operations’ Design Change Notice Process

## EXECUTIVE SUMMARY

### Why the OIG Did This Evaluation

The Tennessee Valley Authority’s (TVA) drawing program is designed and maintained to document the configuration of TVA’s systems, structures, and components. Drawings are utilized for a variety of reasons, including plant operation, maintenance activities, troubleshooting, and to establish clearance boundaries for isolating equipment so that work can be performed safely. Modifications to configuration should be captured through TVA’s Design Change Notice (DCN) process to ensure configuration control is maintained and drawings are updated to reflect the changes.

Due to the importance of accurate drawings to plant personnel safety, and in response to plant personnel concerns raised during a previous evaluation,<sup>i</sup> we initiated an evaluation of Coal Operations’ DCN process. Our objective was to determine if the DCN process was being followed for modifications made to coal plant drawings. The scope of our evaluation included drawings and DCNs at all six of TVA’s active coal plants.

### What the OIG Found

We determined that when the DCN process was utilized, DCNs were generally in compliance with procedural requirements and drawings appeared to have been updated accordingly.<sup>ii</sup> However, we determined the DCN process was not always followed for modifications made to coal plant drawings. Specifically, we found (1) modified drawings onsite that had not been updated through DCNs; (2) hand-illustrated drawings utilized in lieu of approved, computer-generated drawings; (3) outdated drawings potentially referenced in the course of work; and (4) reluctance at the sites to initiate the DCN process. Additionally, we identified opportunities for improvement related to (1) training, (2) drawing descriptions, (3) communication of DCN status and drawing availability, and (4) outdated standard programs and processes and intergroup agreements.

<sup>i</sup> Evaluation 2016-15391, Gas Plant Preventive Maintenance, June 29, 2017. Although the concerns were raised during a gas plant evaluation, we chose to evaluate Coal Operations’ DCN process because we determined the risk to be greater at coal plants due to their age.

<sup>ii</sup> Due to the technical nature of the drawings, we did not review them for accuracy.



# Evaluation 2018-15587 – Coal Operations’ Design Change Notice Process

## EXECUTIVE SUMMARY

### What the OIG Recommends

We recommend the Senior Vice President, Power Operations, take action related to DCN (1) expectations, (2) training, (3) drawings, (4) communication, and (5) standard programs and processes. Our detailed recommendations are listed in the body of this report.

### TVA Management’s Comments

In response to our draft report, TVA management stated actions have been or will be taken to address the recommendations. See the Appendix for management’s complete response.

### Auditor’s Response

We concur with TVA management’s stated actions.

## **BACKGROUND**

The Tennessee Valley Authority's (TVA) drawing program is designed and maintained to document the configuration of TVA's systems, structures, and components. Drawings are maintained in the Business Support Library (BSL) and are utilized by plant personnel for a variety of reasons, including plant operation, maintenance activities, troubleshooting, and to establish clearance boundaries for isolating equipment so that work can be performed safely. TVA's Design Change Notice (DCN) process was developed to ensure that new additions, modifications, or removals of assets within its systems, structures, and components and other designated features have an adequate design basis.<sup>1</sup>

The DCN process, governed by Power Operations (PO) Standard Programs and Processes (SPP) 09.002, *Design Change Control*, was designed to include all affected organizations in the change process and to ensure impacts to safety, construction, operation, maintenance, and/or the environment are addressed. DCNs are initiated by submitting a form documenting the DCN scope and approval to TVA's Configuration Management and Document Control (CMDC) group. The DCN screening review is then performed to identify which forms and reviews will be relevant to the DCN and should be completed and included in the DCN package. All DCNs are required to include a package document list identifying DCN-related documents (such as drawings, engineering sketches, vendor manuals, etc.) that are to be uploaded to or updated in the BSL. Based on the screening performed, other steps and documentation may be necessary, such as modification impact reviews, modification criteria, component unique identifiers data sheets, DCN documentation transmittal sheets, and advance authorization change requests. All required documentation should be included in the DCN package provided to CMDC and stored in the BSL.

Modifications to system, structure, and component configuration should be captured through TVA's DCN process to ensure configuration control is maintained and drawings are updated to reflect any changes. Due to the importance of accurate drawings to plant personnel safety, and in response to plant personnel concerns raised during a previous evaluation,<sup>2</sup> we initiated an evaluation of Coal Operations' DCN process.

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<sup>1</sup> Design basis includes the parameters, limitations, regulations, calculations, specifications, drawings, vendor manuals, etc., that document how a system, structure, or component was designed and specified to be constructed, operated, and maintained.

<sup>2</sup> Evaluation 2016-15391, Gas Plant Preventive Maintenance, June 29, 2017. Although the concerns were raised during a gas plant evaluation, we chose to evaluate Coal Operations' DCN process because we determined the risk to be greater at coal plants due to their age.

## **OBJECTIVE, SCOPE, AND METHODOLOGY**

The objective of our evaluation was to determine if the DCN process was being followed for modifications made to coal plant drawings. The scope of the evaluation included drawings and DCNs at all six of TVA's active coal plants: Bull Run, Cumberland, Gallatin, Kingston, Paradise, and Shawnee Fossil Plants. To achieve our objective, we:

- Interviewed personnel in CMDC to obtain information regarding the DCN process.
- Reviewed the following documentation to gain an understanding of configuration control, drawings, the DCN process, and procedural requirements:
  - TVA-SPP-09.002, *Design Change Control*
  - PO-SPP-09.002, *Design Change Control*
  - Fossil Power Group (FPG) SPP-09.016, *Drawing Control*
  - TVA-SPP-09.004, *Temporary Alteration Permit (TAP)*
  - FPG-SPP-09.002, *Configuration Control and Temporary Alterations*
  - FPG-SPP-09.008, *Red Line Drawing Incorporation*
  - Fossil Engineering Services (FES) SPP-09.002, *CAD<sup>3</sup> Drafting Standards and Procedures*
  - TVA Intergroup Agreement (IGA) 01.014, *Power Operations and Projects Intergroup Agreement*
  - TVA-IGA-1, *Fossil Power Group/Power System Operations Policy & Organization Manual Intergroup Agreement*
  - TVA-IGA-12.002, *Information Technology and Power Operations: Information Technology's Support of Power Operations Operational Technology*
  - TVA's DCN and BSL training materials
- Conducted site visits at each of the six coal plants to observe drawings maintained onsite and interviewed operations, engineering, and maintenance personnel to gain insight related to drawing use and DCN process challenges.
- Judgmentally selected and tested a sample of 10 of 57 DCNs that were closed during fiscal year 2018 to determine if (1) DCNs were in compliance with procedural requirements and (2) associated drawings were updated accordingly. Our selection of DCNs included at least 1 from each of the six sites, with additional DCNs selected for sites with the most DCNs (Paradise and Shawnee) and least DCNs (Kingston) in the population. We also selected DCNs based on type and complexity to ensure a varied and representative sample.

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<sup>3</sup> Computer-Aided Design

- Obtained and reviewed 30 hardcopy drawings maintained at the six coal plants to determine if drawings had been modified without going through the DCN process. These were selected and provided by plant personnel as examples of drawings they might reference in the course of their work.
- Reviewed documentation in the BSL to determine if (1) DCNs were in compliance with procedural requirements and drawings had been updated accordingly and (2) drawings of record had been updated to reflect drawing modifications identified onsite.

This evaluation was performed in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*.

## **FINDINGS**

We determined that when the DCN process was utilized, DCNs were generally in compliance with procedural requirements and drawings appeared to have been updated accordingly. However, we determined the DCN process was not always followed for modifications made to coal plant drawings. Specifically, we found (1) modified drawings onsite that had not been updated through DCNs; (2) hand-illustrated drawings utilized in lieu of approved, computer-generated drawings; (3) outdated drawings potentially referenced in the course of work; and (4) reluctance at the sites to initiate the DCN process. Additionally, we identified opportunities for improvement related to (1) training, (2) BSL drawing descriptions, (3) communication of DCN status and drawing availability, and (4) outdated SPPs and IGAs.

### **DCNs GENERALLY IN COMPLIANCE WHEN PROCESS WAS UTILIZED**

We determined DCNs were generally in compliance with procedural requirements and drawings appeared to have been updated accordingly.<sup>4</sup> We reviewed 10 of 57 DCNs closed during fiscal year 2018 (18 percent) to verify required forms and approvals were included in the DCN packages; we also searched the BSL to confirm all documents listed in the DCN Package Document List (e.g., drawings, vendor manuals, engineering sketches) had been uploaded to or updated in the BSL as necessary. While we noted some administrative oversights<sup>5</sup> with 3 of the DCNs tested, we determined DCNs generally met the procedural requirements and associated documents appeared to have been updated accordingly.

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<sup>4</sup> Due to the technical nature of the drawings, we did not review them for accuracy.

<sup>5</sup> These observations included a missing form, a missing revision log, forms that should have been separate but had been combined, and a missing review signoff.

## DCN PROCESS WAS NOT ALWAYS FOLLOWED

We determined the DCN process was not always followed for modifications made to coal plant drawings. Our findings included (1) modified drawings onsite that had not been updated through DCNs; (2) hand-illustrated drawings utilized in lieu of approved, computer-generated drawings; (3) outdated drawings potentially referenced in the course of work; and (4) reluctance at the sites to initiate the DCN process.

### **Modifications Made to Drawings Onsite Not Captured Through DCNs**

During the course of our site visits, we reviewed 30 drawings from six coal plants. We compared the drawings provided onsite to the most recent versions contained in the BSL to determine if modifications had been made outside the appropriate channels and thus not captured on drawings of record in the BSL. We found that 7 of the 30 drawings included edits; 4 of these contained modifications that had not been captured on the drawings of record in the BSL. Based on these observations, we determined modifications had been made outside the DCN process.

### **Hand-Illustrated Drawings Used in Lieu of Approved Drawings**

According to FPG-SPP-09.016, *Drawing Control*, drawings are to be developed in accordance with FES-SPP-09.002, *CAD Drafting Standards and Procedures*. Plant personnel at two of the sites provided four examples of hand-illustrated drawings they use due to lack of approved, computer-generated drawings. According to plant personnel, drawings were never provided at the completion of the respective projects, so they created hand-illustrated drawings depicting the configuration modifications for reference.

Plant personnel interviewed at five of the six sites indicated not receiving all necessary drawings at the completion of projects is a common issue, whether the drawings were never created or the drawings were never transferred from contractors' databases and made available in the BSL. They also expressed confusion around how to have missing drawings created through approved channels after the projects have been completed.

### **Outdated Drawings Potentially Used**

While onsite, we asked plant personnel to provide examples of drawings kept onsite in hardcopy format that they would reference in the course of their work. We noted 17 of the 30 drawings provided were between 1 and 11 revisions behind the most recent version found in the BSL; 3 of these drawings had been superseded and 1 had been voided. One of the drawings provided onsite was visibly stamped "superseded." The plant employee who provided the drawing explained they opted to use the superseded version because they felt more comfortable with the accuracy of that version. According to this employee, the version of the drawing updated in the BSL depicted the "as designed" configuration rather than the actual "as constructed" configuration of the system. Another site corroborated that sometimes the drawings updated in BSL are inaccurate due to configuration changes made over the years in the plant but

never captured on the drawings of record at the time the change was implemented.

Although the majority of the drawings provided were outdated, it is important to note that many personnel stated they take precautionary measures, such as checking the BSL or walking the system down to verify configuration, before relying on a potentially inaccurate drawing.

### **Reluctance at the Sites to Initiate the DCN Process**

A common theme that emerged during our site visits and interviews with plant personnel was a reluctance to initiate the DCN process. Several interviews indicated that DCNs are avoided by delaying maintenance activities, implementing workarounds, or going ahead with the work but doing so without initiating DCNs. Plant personnel at all six sites expressed frustration with what they perceive to be a cumbersome process and confusion around process requirements or goals. Interviews indicated the sites would be more willing to utilize the DCN process when needed if the process was simplified where possible and appropriate. According to site personnel, minor configuration modifications, such as adding a valve, could be handled through a less rigorous process while still gaining the appropriate concurrences and capturing the changes on drawings of record. Additionally, several plant personnel indicated drawing inaccuracies could be corrected quicker and more easily through a smaller, possibly more localized process at the sites.

Interviews revealed additional factors contributing to the reluctance to go through the DCN process, including (1) a perceived lack of ownership or responsible party at the sites to monitor and drive the DCN process; (2) long turnaround times; (3) DCNs being submitted, but never fully completed, and consequently drawings not being updated; and (4) lack of communication regarding the status of DCNs submitted and drawing availability. These factors, combined with limited resources at the sites, have culminated in a lack of incentive for plant personnel to initiate what is perceived as a tedious process that may or may not yield positive results.

## **OPPORTUNITIES FOR IMPROVEMENT**

Interviews with plant personnel identified additional opportunities for improvement regarding (1) DCN and BSL training, (2) BSL drawing descriptions, (3) communication of DCN status and drawing availability, and (4) outdated SPPs and IGAs.

### **Training**

Interviews with plant personnel revealed a need for BSL training and more robust DCN training. While there is a computer-based DCN training course available in TVA's Learning Management System, it is not a required course and only serves as a general overview of the procedure and procedural requirements. Plant personnel expressed confusion around the process, responsible parties, requirements or reasoning behind the requirements, and stated more DCN

training would be helpful. Plant personnel also stated the BSL is difficult to understand and navigate and training regarding how to search and find drawings in the BSL would be beneficial.

Some personnel interviewed stated interfacing with organizations outside Coal Operations creates configuration control challenges, where sometimes work is performed onsite that modifies configuration and the plant is unaware until discovering these changes after the fact. Specifically, plant personnel stated Facilities, Information Technology, and Fire Protection organizations could benefit from training and reinforcement of DCN expectations while performing work at the sites. For example, according to a member of one plant's management team, the site encountered a "near miss" event when a clearance was issued that tagged out the wrong electrical feed, which had been changed as part of a fire protection project. According to TVA's documentation of the incident, the incorrect clearance was the result of a breakdown in the DCN process where the unique identifiers and clearance standards were not updated as they should have been when the breaker configuration was changed.

There also seemed to be a lack of understanding among some sites' maintenance groups regarding what would constitute a configuration change and when DCNs would be necessary. For example, engineering personnel at one site expressed frustration at continually discovering configuration changes implemented by a specific maintenance group without going through the proper channels and following required processes. Meanwhile, the same maintenance group expressed a belief that they follow appropriate protocol for the configuration changes they implement. If personnel are unsure of how to follow the DCN process or when the process should be initiated, this could result in work being done without obtaining necessary DCNs.

Subsequent to our site visits and interviews with plant personnel, TVA developed and began offering enhanced DCN training classes to address identified gaps. According to TVA, training attendance thus far is being reviewed to determine where the remaining audience is located so that more classes can be offered regionally and at the plants (including Information Technology and Facilities organizations). Additionally, TVA stated the computer-based training course will be updated and required on an annual basis as a refresher course for parties involved in the DCN process.

### **BSL Drawing Descriptions**

A recurring theme identified in interviews with plant personnel was that drawing descriptions contained in the BSL could be improved, especially for contractor drawings and vendor manuals. According to site personnel, the drawing descriptions put into the BSL are often generic or use different terminology than is typically used at the sites, which makes searching for drawings difficult and time consuming. Additionally, contractor drawings do not typically follow TVA's drawing-number convention, creating additional difficulties in locating the correct drawings. Based on these interviews and our own observations when trying to locate drawings as part of our DCN testing, we determined there are

opportunities for improvement related to document titles and descriptions put into the BSL.

### Communication of DCN Status and Drawing Availability

Based on our interviews, there appeared to be gaps regarding communication of the status of DCNs submitted, the completion of DCN requests, and when drawings are updated and made available in the BSL. Personnel at all six sites indicated feedback on DCN status or drawing availability would be helpful. DCNs can be tracked in TVA's work management system, Maximo; however, interviews indicated plant personnel were unaware of this or how to do so. Additionally, some plant personnel, such as unit operators who identify drawing inaccuracies to be corrected through DCNs, are not typically required to be included in the DCN process past initial identification. However, some of these personnel indicated feedback regarding DCN closure and drawing availability would be a useful tool. Implementation of a feedback loop for interested parties could serve as an incentive for plant personnel to initiate the DCN process.

### Outdated SPPs and IGAs

During our review of procedures and IGAs relevant to configuration control and drawings, we identified several outdated SPPs and IGAs, most of which were past their defined review cadences. These SPPs dated back as far as 2007; see Table 1 below:

Procedure	Effective Date	Review Cadence
TVA-SPP-09.002, <i>Design Change Control</i>	09/30/2011	2 years
FPG-SPP-09.008, <i>Red Line Drawing Incorporation</i>	07/05/2011	2 years
FPG-SPP-09.016, <i>Drawing Control</i>	03/03/2008	2 years
TVA-SPP-09.004, <i>Temporary Alteration Permit (TAP)</i>	09/30/2011	2 years
FPG-SPP-09.002, <i>Configuration Control and Temporary Alterations</i>	07/11/2011	2 years
FES-SPP-09.002, <i>CAD Drafting Standards and Procedures</i>	04/01/2007	Not Defined
TVA-IGA-1, <i>Fossil Power Group/Power System Operations Policy &amp; Organization Manual Intergroup Agreement</i>	06/30/2008	Not Defined
TVA-IGA-01.014, <i>Power Operations and Projects Intergroup Agreement</i>	03/17/2014	3 Years

Table 1

At the time of our evaluation, PO-SPP-09.002, *Design Change Control*, was under revision and included an edit to clarify that it supersedes FPG-SPP-09.008, *Red Line Drawing Incorporation*. However, we did not see any indication of the other outdated SPPs being superseded or reviewed. Additionally, FPG-SPP-09.002, *Configuration Control and Temporary Alteration*, and TVA-IGA-1, *Fossil Power Group/Power System Operations Policy & Organization Manual Intergroup*

*Agreement*, referenced other procedures that we were unable to locate active versions of in TVA's Procedure Center. These included:

- FPG-SPP-09.053, *Design Document Reviews*
- TVA-SPP-05.10, *Environmental Compliance Management System (ECMS)*
- COO-SPP-9.2, *Design Change Notices Process*
- FPG-SPP-10.002, *Control of Generation Sensitive Activities*
- FPG-SPP-10.007, *NERC<sup>6</sup> Reporting Requirements for Generator System Voltage Control*
- COO-003, *Asset Availability*
- FPG-E&CI-001, *Fossil Power Group Electrical & Controls Manager's Expectations For Calculations*
- FPG-SPP-09.001, *Plant Modifications and Engineering Change Control*

## **RECOMMENDATIONS**

Based on the findings and observations described above, we recommend the Senior Vice President, PO:

- Evaluate the need for updating drawings of record to eliminate inaccuracies and reduce the potential safety risks associated with using incorrect drawings.

**TVA Management's Comments** – TVA management stated the need for updating drawings of record will be evaluated and a strategy will be established to address the results of the evaluation. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

- Emphasize the step in the DCN process for responsible parties to ensure all drawings are available, updated, and ready for use prior to authorizing the DCN for closure.

**TVA Management's Comments** – TVA management stated the new DCN training will be updated to emphasize verification that all drawings are available, updated, and ready to use prior to authorizing the DCN for closure. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

- In conjunction with the sites, evaluate the DCN process to identify potential efficiencies regarding smaller configuration modifications and correcting drawing inaccuracies.

**TVA Management's Comments** – TVA management stated the DCN process will be evaluated by a team consisting of site and corporate personnel to identify potential efficiencies regarding smaller configuration

<sup>6</sup> North American Electric Reliability Corporation

modifications and correcting drawing inaccuracies. A strategy will be established to address the results of the evaluation. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

- Provide the newly developed DCN training to Fire Protection personnel and determine if any other organizations not currently planned to attend the training could benefit from doing so.

**TVA Management's Comments** – TVA management stated DCN training will be provided to Fire Protection personnel and an evaluation of impacted PO and non-PO stakeholders has been performed. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned and taken actions and will verify completion prior to closing the recommendation.

- Reinforce DCN expectations for outside organizations performing work onsite.

**TVA Management's Comments** – TVA management stated Coal senior leadership will reinforce the DCN expectations to clearly communicate to internal and external organizations that adherence to the DCN process is a requirement. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

- Evaluate options for adding TVA identification to vendor drawings for consistency and to aid in searching for drawings.

**TVA Management's Comments** – TVA management stated options for adding TVA identification to vendor drawings will be evaluated and a strategy will be established to address the results of the evaluation. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

- Provide training on searching for TVA and vendor drawings in the records management system, including education regarding methods available for site personnel to provide input on drawing titles and descriptions put into the system.

**TVA Management's Comments** – TVA management stated training modules have been established. The new DCN training will be updated to include education regarding methods available for site personnel to provide input on drawing titles and descriptions. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned and taken actions and will verify completion prior to closing the recommendation.

- Communicate methods of tracking DCN status to plant personnel and implement a feedback loop to communicate DCN and drawing status to interested parties.

**TVA Management's Comments** – TVA management stated a feedback loop to communicate DCN status and drawing status has been implemented. See the Appendix for management's complete response.

**Auditor's Response** – The TVA manager responsible for this action subsequently clarified that DCN tracking will also be included in the DCN training. We concur with management's planned and taken actions and will verify completion prior to closing the recommendation.

- Review outdated SPPs and IGAs and update as necessary.

**TVA Management's Comments** – TVA management stated the procedures identified in this report will be reviewed and updated as necessary. See the Appendix for management's complete response.

**Auditor's Response** – We concur with management's planned actions.

May 22, 2019

David P. Wheeler, WT 2C-K

MANAGEMENT RESPONSE - DRAFT EVALUATION 2018-15587 - COAL OPERATIONS'  
DESIGN CHANGE NOTICE PROCESS

This is in response to your memorandum dated April 5, 2019. First, let me thank your team for the professional manner in which this audit was conducted. After review of the draft evaluation, we have prepared the following response to the recommendations regarding Coal Operations Design Change Notice Process.

Recommendations

1. We recommend the Senior Vice President (SVP), Power Operations (PO) evaluate the need for updating drawings of record to eliminate inaccuracies and reduce the potential safety risks associated with using incorrect drawings.

Response

The need for updating drawings of record to eliminate inaccuracies and reduce the potential safety risks will be evaluated. A strategy will be established to address the results of the evaluations.

Owner - Curtis Rodenhaber

Due Date - 10/31/2019

2. We recommend the SVP, PO emphasize the step in the DCN process for responsible parties to ensure all drawings are available, updated, and ready to use prior to authorizing the DCN for closure.

Response

The new DCN training will be updated to emphasize verification that all drawings are available, updated, and ready to use prior to authorizing the DCN for closure.

Owner - Kim Brandon

Due Date - 9/30/2019

3. We recommend the SVP, PO, in conjunction with the sites, evaluate the DCN process to identify potential efficiencies regarding smaller configuration modifications and correcting drawing inaccuracies.

David P. Wheeler  
Page 2  
May 22, 2019

Response

The DCN process will be evaluated to identify potential efficiencies regarding smaller configuration modifications and correcting drawing inaccuracies. This evaluation will be performed by a team consisting of site and corporate personnel. A strategy will be established to address the results of the evaluation.

Owner - Kim Brandon  
Due Date - 4/3/2020

4. We recommend the SVP, PO provide the newly developed DCN training to Fire Protection personnel and determine if any other organizations not currently planned to attend the training could benefit from doing so.

Response

An evaluation of impacted PO and non-PO stakeholders has been performed and is listed in the Change Management Plan (CMP) for Revision 1 of PO-SPP-09.002, *Design Change Control*. Fire Protection personnel are part of Generation Services (which is identified in the CMP as an impacted stakeholder) and will be provided the new DCN training.

Owner - Kim Brandon  
Due Date - 9/30/2019

5. We recommend the SVP, PO reinforce DCN expectations for outside organizations performing work onsite.

Response

Coal senior leadership will reinforce the DCN expectations to plant personnel involved in the DCN process, ensuring that we are clearly communicating to our internal and external organizations that adherence to the DCN process is a requirement.

Owner - Curtis Rodenhaber  
Due Date - 9/30/2019

6. We recommend the SVP, PO evaluate options for adding TVA identification to vendor drawings for consistency and to aid in searching for drawings.

David P. Wheeler  
Page 3  
May 22, 2019

Response

Options for adding TVA identification to vendor drawings for consistency and to aid in searching for drawings will be evaluated, and a strategy will be established to address the results of the evaluation.

Owner - Kim Brandon  
Due Date - 4/3/2020

7. We recommend the SVP, PO provide training on searching for TVA and vendor drawings in the records management system, including education regarding methods available for site personnel to provide input on drawing titles and descriptions put into the system.

Response

Power Operations has recently migrated to Enterprise Content Management (ECM). Training modules have been established in the Learning Management System to provide training on searching ECM for TVA and vendor drawings. The Knowledge Center also has ECM training available 24/7. The new DCN training will be updated to include education regarding methods available for site personnel to provide input on the drawing titles and descriptions.

Owner - Kim Brandon  
Due Date - 9/30/2019

8. We recommend the SVP, PO communicate methods of tracking DCN status to plant personnel and implement a feedback loop to communicate DCN and drawing status to interested parties.

Response

Communication with interested parties at the sites is a responsible engineer responsibility. The DCN training will be updated to emphasize this role. Also, a feedback loop to communicate DCN status and drawing status has been implemented per PO-SPP-09.002, Section 3.1.12.

Owner - Kim Brandon  
Due Date - 9/30/2019

David P. Wheeler  
Page 4  
May 22, 2019

9. We recommend the SVP, PO review outdated SPPs and IGAs and update as necessary.

Response

Procedures in Table 1 of the OIG report will be reviewed and updated as necessary. Below is the table for each procedure and its respective owner.

Procedure	Organization Owner
TVA-SPP-09.002, <i>Design Change Control</i>	Transmission & Power Supply
FPG-SPP-09.008, <i>Red Line Drawing Incorporation</i>	Power Operations
FPG-SPP-09.016, <i>Drawing Control</i>	Power Operations
TVA-SPP-09.004, <i>Temporary Alteration Permit (TAP)</i>	Transmission & Power Supply
FPG-SPP-09.002, <i>Configuration Control and Temporary Alterations</i>	Power Operations
FES-SPP-09.002, <i>CAD Drafting Standards and Procedures</i>	Power Operations
TVA-IGA-1, <i>Fossil Power Group/Power System Operations Policy &amp; Organization Manual Intergroup Agreement</i>	Power Operations
TVA-IGA-01.014, <i>Power Operations and Projects Intergroup Agreement</i>	Power Operations

Owner - Kim Brandon  
Due Date - 4/3/2020

Thank you for the opportunity to provide these comments. If you need additional information, please contact me directly.

  
Jacinda B. Woodward  
Senior Vice President  
Power Operations  
LP 2K-C

MEF:DTT:CLG  
cc: See page 5

David P. Wheeler  
Page 5  
May 22, 2019

cc: Clifford L. Beach, Jr., WT 6A-K  
Robertson D. Dickens, WT 9C-K  
Kris G. Edmondson, LP 2K-C  
Melanie E. Farrell, LP 2K-C  
Dwain K. Lanier, MR 6D-C

Sherry A. Quirk, WT 7C-K  
Ronald R. Sanders II, MR 5E-C  
Michael D. Skaggs, WT 7B-K  
Rebecca C. Tolene, WT 7B-K