



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

May 11, 2023

James R. Dalrymple  
Jacinda B. Woodward

**REQUEST FOR MANAGEMENT DECISION – EVALUATION 2022-17377 – POWER OPERATIONS’ HAZARDOUS CHEMICALS**

Title 29, Code of Federal Regulations (CFR), Section 1910.1200, (29 CFR § 1910.1200), *Hazard Communication*, establishes directives for the identification, communication, and handling and storage of hazardous chemicals. According to 29 CFR § 1910.1200, employers are to provide information to their employees about the hazardous chemicals to which they are exposed. The information can be provided through a hazard communication program, labels and other forms of warning, safety data sheet (SDS) and training. The Tennessee Valley Authority (TVA) Safety Procedure (TSP) 18.917, *Hazard Communication*, establishes TVA’s written hazard communication program. Due to the risks associated with hazardous chemicals at generating plants, we conducted an evaluation of its hazardous chemicals. The objectives of our evaluation were to determine if hazardous chemicals at Power Operations’ sites were (1) adequately identified and communicated and (2) properly handled and stored.

We determined hazardous chemicals at most Power Operations’ sites we visited were not adequately identified or communicated. Specifically, most sites had incomplete hazardous chemical lists or unmarked containers. In addition, we selected items from a storage location at each site and determined hazardous chemicals selected were properly stored according to their SDS instructions. We were unable to determine if hazardous chemicals were being handled properly because we did not observe any chemical use. However, we did find that 10 of 33 individuals interviewed could not retrieve an SDS, which could increase the risk that hazardous chemicals may not be properly handled and stored. Additionally, our testing identified 2 sites with best practices.

We recommend the Senior Vice President, Power Operations, and the Senior Vice President, Resource Management and Operations Services, take steps to (1) ensure hazardous chemicals are adequately identified and communicated and (2) address knowledge gaps for accessing SDSs.

In response to our draft report, TVA management agreed with our recommendations. See the Appendix for TVA management’s complete response.

## **BACKGROUND**

29 CFR § 1910.1200, *Hazard Communication*, requires employers to establish a hazard communication program. According to the CFR, hazardous chemicals are to be identified, communicated, and properly handled and stored. Specifically, the CFR directs employers to communicate information concerning hazards and protective measures to employees by means of:

- Developing and maintaining a written hazard communication program.
- Listing of hazardous chemicals present in the workplace.
- Providing the appropriate SDS<sup>1</sup> for chemicals present in the workplace.
- Labeling of containers of chemicals.
- Developing and implementing employee-training programs regarding hazards of chemicals and protective measures.<sup>2</sup>

TVA-TSP-18.917, *Hazard Communication*, states each plant/facility shall maintain a list of hazardous chemicals and have an SDS available for each hazardous chemical used. An SDS provides the handling and storage requirements and other pertinent information for each specific chemical. Additionally, any employee who may be exposed to hazardous chemicals must be provided information and training prior to initial assignment to work with a hazardous chemical and whenever a new chemical hazard is introduced into the work area. Specifically, 29 CFR § 1910.1200 requires employers to train employees on the details of the hazard communication program and SDSs, including the order of information and how employees can obtain and use appropriate hazard information. TVA has the Hazardous Communication Program information readily accessible on the TVA Safety Web page along with access to SDSs for any site. TVA also provides the capability to access the SDS system by a mobile application.

Due to the risks associated with hazardous chemicals at generating plants, we conducted an evaluation of its hazardous chemicals.

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

The objectives of this evaluation were to determine if hazardous chemicals at Power Operations' sites were (1) adequately identified and communicated and (2) properly handled and stored. The scope of this evaluation was hazardous chemicals maintained at selected TVA Power Operations' sites. To achieve our objectives, we:

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<sup>1</sup> An SDS is written material provided by the manufacturer of the chemical which typically states if the chemical is hazardous or nonhazardous, and contains 16 different types of information such as composition or ingredients, first aid measures, handling and storage requirements, and firefighting measures, etc.

<sup>2</sup> The CFR does not specify a training cadence interval. The CFR only requires initial training and retraining when a new chemical hazard is introduced to the work area.

- Reviewed the following TVA processes and procedures and federal regulations to obtain an understanding of hazard communication, hazard identification, and hazard handling and storage requirements.
  - TVA Standard Programs and Processes 18.001, *Safety Program*
  - TVA-TSP-18.219, *Process Safety Management and Risk Management Plan Requirements*
  - TVA-TSP-18.917, *Hazard Communication*
  - 29 CFR § 1910.1200, *Hazard Communication*
- Selected 15 of 52 Power Operations' sites to perform site visits to verify the evaluation objectives. We selected all 5 coal sites (Bull Run, Cumberland, Gallatin, Kingston, and Shawnee) and randomly selected 5 gas sites (Allen, Johnsonville, Kemper, Lagoon Creek, and Marshall) and 5 hydro sites (Apalachia, Chatuge, Chickamauga, Nickajack, and Watts Bar). For each site we:
  - Obtained hazardous chemical lists for each site and compared 3 chemicals<sup>3</sup> from each site's storage locations<sup>4</sup> to the site's lists to determine if the hazardous chemicals had been identified. In total, we reviewed 300 chemicals.
    - o Reviewed the SDS for all chemicals that were not on the site's list to determine if the chemicals were hazardous or nonhazardous.
  - Reviewed each site's storage locations to determine if chemicals were properly labeled, tagged or marked.
  - Haphazardly selected one storage location at each site and selected 3 chemicals (45 total) to verify the chemicals were stored in accordance with the SDS storage requirements.
  - Used convenience<sup>5</sup> sampling to select 33 total plant personnel, at the selected sites, for interviews to assess employees' knowledge of the site's hazard lists, ability to locate the Hazard Communication Program and chemical SDSs on TVA's Safety Web page. The employees were selected based on availability and their need to use chemicals to perform job responsibilities.
- Reviewed TVA's health and safety system of record to identify incidents involving hazardous chemicals that resulted in injuries.

We were unable to verify proper handling because we did not observe any employees using hazardous chemicals during our site visits.

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

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<sup>3</sup> We selected our sample using haphazard sampling, which is a sampling method in which the auditor does not intend to employ a systematic approach to select a sample.

<sup>4</sup> We reviewed the areas TVA personnel indicated hazardous chemicals were stored. Some sites had more than one storage location. In addition, both hazardous and nonhazardous chemicals may be stored in the same location.

<sup>5</sup> Convenience sampling is a specific type of nonprobability sampling method that relies on data collection from population members who are conveniently available.

**FINDINGS**

We determined hazardous chemicals at most Power Operations’ sites we visited were not adequately identified or communicated. Specifically, most sites had incomplete hazardous chemical lists or unmarked containers. In addition, we selected items from a storage location at each site and determined hazardous chemicals selected were properly stored according to their SDS instructions. We were unable to determine if hazardous chemicals were being handled properly because we did not observe any chemical use. However, we did find that 10 of 33 individuals interviewed could not retrieve an SDS, which could increase the risk that hazardous chemicals may not be properly handled and stored. Additionally, our testing identified 2 sites with best practices.

**HAZARDOUS CHEMICALS AT MOST SITES WERE NOT ADEQUATELY IDENTIFIED AND COMMUNICATED**

Both 29 CFR § 1910.1200 and TVA-TSP-18.917, *Hazard Communication*, require sites to maintain a hazardous chemical inventory list. The TSP requires specific information, such as product name, chemical name, manufacturer, and use, etc. While all 15 selected sites provided a hazardous chemical inventory list, the lists for only 5 sites (Apalachia, Chatuge, Chickamauga, Nickajack, and Gallatin) contained all the appropriate information as required by the TSP such as chemical name, product name, use, etc. Additionally, we found the inventory list for 13 of 15 sites to be incomplete. Specifically, of 300 selected chemicals, we identified 76<sup>6</sup> hazardous chemicals on-site that were not on the site’s inventory. See Table below for details by site.

	<b>Chemicals Reviewed at Each Site</b>	<b>Hazardous Chemicals Identified Not on Site List</b>
<b>Coal Sites</b>		
Bull Run	33	18
Cumberland	30	14
Gallatin	24	8
Kingston	30	8
Shawnee	27	8
<b>Gas Sites</b>		
Allen	15	2
Johnsonville	21	2
Kemper	15	3
Lagoon Creek	27	2
Marshall	9	0
<b>Hydro Sites</b>		
Apalachia	3	0
Chatuge	3	2
Chickamauga	30	6
Nickajack	15	1
Watts Bar	18	2

<sup>6</sup> Eighty chemicals total were not on the list. A review of each SDS indicated 4 of 80 were nonhazardous chemicals.

Additionally, both 29 CFR § 1910.1200 and TVA-TSP-18.917 require containers of hazardous chemicals to be labeled.<sup>7</sup> We reviewed the storage locations at each site to identify any chemicals that were not properly labeled, tagged or marked. We found 8 of 15 sites (53 percent) had potentially hazardous chemicals stored in unlabeled, untagged, or unmarked containers.<sup>8</sup> There were no exceptions identified at the 5 hydro sites visited. See below for detail of the exceptions identified at coal and gas sites.

<b>Unmarked Chemical Containers</b>	
<b>Coal Sites</b>	
Bull Run	1
Cumberland	2
Gallatin	2
Kingston	2
Shawnee	3
<b>Gas Sites</b>	
Allen	2
Johnsonville	3
Kemper	1

### **INCREASED RISK THAT HAZARDOUS CHEMICALS COULD BE HANDLED OR STORED IMPROPERLY**

As mentioned previously, the SDS provides the handling and storage requirements for each specific hazardous chemical. We reviewed the storage requirements listed on the SDSs for the sample of 45 hazardous chemicals selected for review and determined they were properly stored. While at the sites, we did not observe any personnel actively working with chemicals, and were therefore unable to determine if hazardous chemicals were being handled properly. However, we did identify an issue that could increase the risk chemicals are not properly handled and stored.

TVA-TSP-18.917, *Hazard Communication*, requires all employees who use chemicals and hazardous materials comply with the requirements of the hazard communication program, container labels and SDS requirements. According to training required for any employee who may be exposed to hazardous chemicals, personnel should review the SDS for hazards and protective measures associated with chemicals and discuss during the pre-job brief. During our site visits, 10 of 33 personnel interviewed were unable to navigate to an SDS without assistance. Without the ability to navigate to the SDS to identify proper handling and storage requirements for hazardous chemicals, risk to employee safety could be increased.

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<sup>7</sup> One exception allowed by 29 CFR § 1910.1200 and TVA-TSP-18.917 is that labeling is not required for portable secondary containers whenever chemicals are transferred from labeled containers and which are intended only for the immediate use of the employee who performs the transfer.

<sup>8</sup> The exception for secondary containers did not apply to any of our identified exceptions.

## **HAZARD COMMUNICATION BEST PRACTICES IDENTIFIED**

During our evaluation of the 15 selected sites, we identified 2 sites with best practices. Our testing found no discrepancies at the Apalachia Hydro and Marshall Combustion Turbine sites as all hazardous chemicals we observed at these sites were identified, labeled and stored properly. All personnel interviewed at the sites were well versed in explaining and using the online SDS system and the use of their cell phone for SDS applications. These sites could potentially serve as models for the hazardous communication program at other locations.

## **RECOMMENDATIONS**

We recommend the Senior Vice President, Power Operations, and the Senior Vice President, Resource Management and Operations Services:

- Identify all hazardous chemicals at Power Operations' sites.
- Properly label all chemicals at Power Operations' sites.
- Take steps to close employee knowledge gaps for accessing SDSs to reduce the risk to employee safety.

**TVA Management's Comments** – TVA management agreed with our recommendations and indicated deficiencies identified have been corrected. Additional actions will be implemented to ensure sustainability. See the Appendix for TVA management's complete response.

This report is for your review and management decision. You are responsible for determining the necessary actions to take in response to our findings. Please advise us of your management decision within 60 days from the date of this report. 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 need additional information, please contact Samuel L. Ruble, Senior Auditor, at (865) 633-7384 or Lindsay J. Denny, Director, Evaluations at (865) 633-7349. We appreciate the courtesy and cooperation received from your staff during the evaluation.



David P. Wheeler  
Assistant Inspector General  
(Audits and Evaluations)

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Jacinda B. Woodward  
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OIG File No. 2022-17377

May 5, 2023

David P. Wheeler

REQUEST FOR COMMENTS – EVALUATION 2022-17377 – POWER OPERATIONS'  
HAZARDOUS CHEMICALS

Tennessee Valley Authority (TVA) Power Operations (Power Ops) would like to thank Sam Ruble (OIG Lead Auditor) for evaluating Power Ops' management of hazardous chemicals. The health and safety of our workforce and the public is TVA's top priority. We appreciate the TVA Office of the Inspector General team's insights in their report as it provides us an opportunity to further strengthen our health and safety efforts.

As requested in the OIG memorandum dated April 6, 2023, Power Ops has reviewed your draft evaluation and provides the following response.

Recommendations

You recommended the Senior Vice President, Power Operations, and the Senior Vice President, Resource Management and Operations Services:

- Identify all hazardous chemicals at Power Ops' sites.
- Properly label all chemicals at Power Ops' sites.
- Take steps to close employee knowledge gaps for accessing Safety Data Sheets (SDSs) to reduce the risk to employee safety.

Response

Power Operations agrees with the above recommendations. Deficiencies identified by the auditor during the evaluation have been corrected as documented in Maximo Action Tracking Items (ATIs). Additional actions will be implemented to ensure sustainability in addressing the above recommendations. Thank you for allowing us to provide this response. Please contact us with any questions.



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