



Fluor Federal Services, Inc.
Paducah Deactivation Project
P.O. Box 369
Kevil, KY 42053
USA

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FPAD-16-1257

Ms. Marcia Fultz, Contracting Officer
U.S. Department of Energy
Portsmouth/Paducah Project Office
1017 Majestic Drive, Suite 200
Lexington, KY 40513

Dear Ms. Fultz:

Task Order DE-DT000774: Fluor Federal Services Paducah Deactivation Project Deliverable No. 82—Roof Structural Integrity Assessment

Fluor Federal Services, Inc., Paducah Deactivation Project (FPDP) is pleased to provide U.S. Department of Energy (DOE) Deliverable No. 82—Roof Structural Integrity Assessment, which is performed on an annual basis. This report is for calendar year 2015.

If you have questions, please contact John Samples at 270-441-6267.

Sincerely,

Joseph C. Poniatowski
Director, Prime Contract Management

e-copy:

J. Woodard, PPPO/PAD
K. Knerr, PPPO/PAD

R. Knerr, PPPO/PAD
B. Nichols, FPDP/PAD

**2015 Annual Process Facilities
Roof Structural Integrity Assessment
Fluor Federal Services, Inc.,
Paducah Deactivation Project**

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Roof Structural Integrity Assessment
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Date Issued—January 2016

U.S. Department of Energy
Office of Environmental Management

Prepared by
FLUOR FEDERAL SERVICES, INC.,
Paducah Deactivation Project
managing the
Deactivation Project at the
Paducah Gaseous Diffusion Plant
under Task Order DE-DT0007774

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1. OBJECTIVE

This assessment documents the required annual inspection of the process facilities roof structures at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, as specified in scope of the U.S. Department of Energy (DOE) Task Order DE-DT0007774, Section C, paragraph C.1.4.1, awarded to Fluor Federal Services, Inc., Paducah Deactivation Project (FPDP) (the Contractor). The Task Order requires that the roofs for the process facilities be maintained in a structurally sound condition and that deferred maintenance of the roofs is prohibited.

2. SCOPE

The following are buildings/structures are considered “process facilities” for the purpose of this assessment.

- C-300 Central Control Building
- C-310-A Product Withdrawal Building
- C-333-A Feed Vaporization Facility
- C-360 Toll Transfer and Sampling Facility
- C-331 Process Building
- C-335 Process Building
- C-315-331 Tie Line
- C-331-333-B East Tie Line
- C-331-335 Tie Line
- C-335-337-A Enclosed Bridge
- C-335-337-C South Tie Line
- C-633-2B North Cooling Tower
- C-633-5 South Blending Cooling Tower
- C-310 Purge and Product Building
- C-315 Surge and Waste Building
- C-337-A Feed Vaporization Facility
- C-360-A Toll Transfer and Sampling Facility Annex
- C-333 Process Building
- C-337 Process Building
- C-331-333-A Enclosed Bridge
- C-331-333-C West Tie Line
- C-331-410 Tie Line
- C-335-337-B North Tie Line
- C-633-2A South Cooling Tower
- C-633-4 North Blending Cooling Tower

3. LIMITATIONS AND RESTRICTIONS

There were no limitations or restrictions related to access to complete the inspections documented in this 2015 Annual Roof Structural Integrity Assessment.

4. METHODOLOGY

The roof structural inspections were conducted by licensed professional engineers using the following steps:

- Reviewed CP5-SM-0101, Roof Structural Integrity Report, and associated Initial Building Roof Assessment forms.
- Used 2015 assessment performed by structural engineer.

- Notified facility manager of need to conduct structural assessment.
- Complied with facility entry and exit requirements.
- Inspected visible columns and load bearing walls for damage.
- Inspected visible beams and joists for damage.
- Inspected visible building roof framing connections for damage or missing connectors.
- Inspected visible roof decking for holes, excessive rust, and signs of leakage.
- Inspected each roof surface.

5. INSPECTION SUMMARY

5.1 C-300 CENTRAL CONTROL BUILDING

The C-300 Central Control Building roof is a reinforced concrete dome supported by reinforced concrete walls. The majority of the roof is not visible from the interior due to the suspended ceiling system. The exterior roof is visible around the perimeter of the building and from the roof of C-310. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

5.2 C-310 PURGE AND PRODUCT BUILDING

The majority of the C-310 Purge and Product Building roof consists of structural steel framing supporting precast concrete panels with a built-up roofing system. The overhanging roof section on the east side of the building has structural steel-supported metal decking. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound. A new 80-mil polyvinyl chloride (PVC) membrane roofing system will be installed on this facility by March of 2016.

5.3 C-310-A PRODUCT WITHDRAWAL BUILDING

The C-310-A Product Withdrawal Building roof consists of structural steel framing supporting precast concrete panels with a built-up roofing system. Some spalling in areas of the precast concrete panels was noticed that had not been noticed in the 2014 assessment. Spalling is considered minor, and the roof is considered structurally sound. A new 80-mil PVC membrane roofing system will be installed on this facility by March of 2016.

5.4 C-315 SURGE AND WASTE BUILDING

The C-315 Surge and Waste Building roof consists of structural steel framing supporting metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

Roof maintenance and repairs are required to stop water leakage inside. An earlier roof assessment performed this year had determined the need for gutter repair, composition flashing repair, patching with felt, cement and ballast rock and application of additional rock where rock is thin and scarce.

5.5 C-333-A FEED VAPORIZATION FACILITY

The C-333-A Feed Vaporization Facility high bay roof consists of structural steel framing supporting metal decking with a built-up roofing system. The control room area (lower) roof consists of masonry walls supporting bar joists and metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

Overall, the upper and lower roofs are in good condition. Minor repairs and maintenance are required to clean the gutters, repair the composition flashing, and fill low-lying areas with felt, cement, and rock to eliminate standing water.

5.6 C-337-A FEED VAPORIZATION FACILITY

The C-337-A Feed Vaporization Facility high bay roof consists of structural steel framing supporting metal decking with a built up roofing system. The control room area (lower) roof consists of masonry walls supporting bar joists and metal decking, with an original built-up roofing system that has been covered with a sprayed polyurethane roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

Minor roof repairs are required as per earlier assessment in 2015. Repairs shall consist of gutter repairs, composition flashing repair and application of additional rock in areas the rock is thin and scarce.

5.7 C-360 TOLL TRANSFER AND SAMPLING FACILITY

The C-360 Toll Transfer and Sampling Facility high bay roof consists of structural steel framing supporting metal decking with a built-up roofing system. The office area roof consists of masonry walls supporting bar joist and metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

Roof requires only minor repair and maintenance. Additional rock required in areas where the rock is thin and scarce.

5.8 C-360-A TOLL TRANSFER AND SAMPLING FACILITY

The C-360-A Toll Transfer and Sampling Facility Annex is a preengineered steel building with an insulated metal roofing system. The decking is obscured from view by the insulation. The facility manager indicated no history of any leaks. No evidence of any leaks was noticed. The health physics office area has a suspended ceiling that obscures the view of the roof in that area. No new structural defects were noticed from what had been observed during the 2014 assessment. The roof is considered structurally sound.

5.9 C-331 PROCESS BUILDING

The C-331 Process Building roof consists of structural steel framing supporting metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. A new 80-mil PVC membrane roofing system was being installed during the time of this assessment. The roof is considered structurally sound.

5.10 C-333 PROCESS BUILDING

The C-333 Process Building roof consists of structural steel framing supporting metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. A new 80-mil PVC membrane roofing system has been installed since the previous assessment. The roof is considered structurally sound.

5.11 C-335 PROCESS BUILDING

The C-335 Process Building roof consists of structural steel framing supporting metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. A new 80-mil PVC membrane roofing system has been installed since previous assessment. The roof is considered structurally sound.

5.12 C-337 PROCESS BUILDING

The C-337 Process Building roof consists of structural steel framing supporting metal decking with a built-up roofing system. No new structural defects were noticed from what had been observed during the 2014 assessment. A new 80-mil PVC membrane roofing system has been installed since previous assessment. The roof is considered structurally sound.

5.13 C-315-331 TIE LINE

The C-315-331 Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-331. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear to be structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.14 C-331-333-A ENCLOSED BRIDGE

The C-331-333-A Enclosed Bridge roof consists of curved, corrugated panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-331. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear to be structurally sound. Access to the bridge will be restricted. It is unlikely that personnel ever will require access to the roofs of the bridge. Any work conducted on the bridge roof can be performed while working inside the basket of an aerial boom lift.

5.15 C-331-333-B EAST TIE LINE

The C-331-333-B Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-331. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.16 C-331-333-C WEST TIE LINE

The C-331-333-C Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-331. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.17 C-331-335 TIE LINE

The C-315-335 Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-335. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.18 C-331-410 TIE LINE

The C-331-410 Tie Line has been removed.

5.19 C-335-337-A ENCLOSED BRIDGE

The C-335-337-A Enclosed Bridge roof consists of curved, corrugated panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-335. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear structurally sound. Access to the bridge will be restricted. It is unlikely that personnel ever will require access to the roofs of the bridge. Any work conducted on the bridge roof can be performed while working inside the basket of an aerial boom lift.

5.20 C-335-337-B NORTH TIE LINE

The C-335-337-B Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-335. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear to be structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will

require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.21 C-335-337-C SOUTH TIE LINE

The C-335-337-C Tie Line roof consists of insulated steel panels supported by structural steel framing. The structure was inspected from the ground and from the roof of C-335. No new structural defects were noticed from what had been observed during the 2014 assessment. Structure and roof appear to be structurally sound. Access to the tie line roofs will be restricted. It is unlikely that personnel ever will require access to the roofs of the tie-line. Any work conducted on the tie-line roofs can be performed while working inside the basket of an aerial boom lift.

5.22 C-633-2A SOUTH COOLING TOWER

The C-633-2A South Cooling Tower top level consists of timber framing supporting tongue and groove timber decking. Timber support framing was not visible. No new structural defects were noticed from what had been observed during the 2014 assessment. Personnel access to the top level will be restricted.

5.23 C-633-2B NORTH COOLING TOWER

The C-633-2B South Cooling Tower top level consists of timber framing supporting tongue and groove timber decking. Timber support framing was not visible. No new structural defects were noticed from what had been observed during the 2014 assessment. Personnel access to the top level will be restricted.

5.24 C-633-4 NORTH BLENDING COOLING TOWER

The C-633-2A South Cooling Tower top level consists of timber framing supporting tongue-and-groove timber decking. Timber support framing was not visible. The structure has tornado damage on the north end. No new structural defects were noticed from what had been observed during the 2014 assessment. Personnel access to the top level will be restricted.

5.25 C-633-5 SOUTH BLENDING COOLING TOWER

The C-633-2B South Cooling Tower top level consists of timber framing supporting tongue and groove timber decking. Timber support framing is not visible. No new structural defects were noticed from what had been observed during the 2014 assessment. Personnel access to the top level will be restricted.

6. BACKGROUND INFORMATION

In 2015, FPD began installing new 80-mil PVC membrane roofing systems on C-310, C-331, C-333, C-335, and C-337 based on results of thermal imaging studies and roof condition reports. As of January 11, 2016, installation of the new systems was complete on C-333, C-335, and C-337. Installation was in progress on C-331. Installation was about to begin on C-310 and C-310-A. Installation of the new roofing systems for these facilities is scheduled to be completed no later than March of 2016.

7. CONCLUSION

Overall, the structural integrity of the process building roof structures appeared sound with little or no changes noticed from the previous initial assessment conducted in 2014. No structural repairs are required at this time. Facility managers will control access to the respective roof areas by administrative or physical controls.