

CONTINUED MONITORING PROGRAM



Omaha Public Power District

OPPD



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses	
From: Bryan Kumm	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: October 20, 2011	Field Report No: FR-076
RE: OPPD FCS Key Distress Indicator Continued Monitoring	

Team Members:

HDR Representatives

Bryan Kumm – Geotechnical
Hugh O'Grady – Civil
Cameron Collingsworth – Structural

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area;
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet and Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.

Data Obtained:

Documentation

- None

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of were obtained by using a digital camera.
- Daily checklist was completed.

Discussions

HDR Engineering, Inc.

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OPPD00001347

- No specific discussions of the results of the day's activities were made between HDR and OPPD representatives.

Observations:

River elevation was about 994 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 70% full,
- West 6-inch line was about 50% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 10% full,
- A 4-inch flexible pipe about 10% full was discharging directly into the sump pit, and
- Time between pump cycles was about 100 seconds.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

Maintenance Shop Column TE15 displacement between top of column and beam is about 2-1/8 inches.

The Caustic Storage Tank pit in the northeast corner of the Service Building had standing water to about Elevation 1004 feet.

Observations were made in the Technical Support Center areas that had not been previously accessed.

Observations in the Technical Support Center were:

- A horizontal crack in the east masonry wall of Room 127 and
- Some separation of the expansion joint along the Auxiliary Building.

Visual observations of note relative to previous observations were:

- Fire Protection Cabinet FP-3C was removed. The area around the cabinet had been excavated resulting in an excavation about 18 feet long, 10 feet wide, and 6 feet deep. The bottom of the excavation did not appear to be ponding water. Excavated soil appeared to consist primarily of clay. No void was observed below the exposed pavement.
- Void below concrete pavement (east-southeast of MH-5) was full of water.

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.

To: Keith Kirchner, John Christiansen, Rick Niedergeses	
From: Bryan Kumm	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: October 27, 2011	Field Report No: FR-077
RE: OPPD FCS Key Distress Indicator Continued Monitoring	

Team Members:
HDR Representatives

Bryan Kumm – Geotechnical
 Hugh O'Grady – Civil
 Cameron Collingsworth – Structural

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet
Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.

Data Obtained:
Documentation

- None

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of were obtained by using a digital camera.
- Daily checklist was completed.

Discussions

- No specific discussions of the results of the day's activities were made between HDR and OPPD representatives.

Observations:

River elevation was about 994 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 70% full,
- West 6-inch line was about 60% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 10% full, and
- Time between pump cycles was about 130 seconds.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

The Caustic Storage Tank pit in the Service Building had been pumped out. No water was observed to be leaking into the pit.

Maintenance Shop Column TE15 displacement between top of column and beam is about 2-1/8 inches.

Visual observations of note relative to previous observations were:

- The excavation at Fire Protection Cabinet FP-3C had been backfilled. Backfill at the surface consisted of crushed limestone,
- Void below concrete pavement (east-southeast of MH-5) was full of water, and
- The southeast corner of the concrete panel at High Mast Light 403 appears to have sunk about ¼ to ½ inches.

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.



Field Report

To: Keith Kirchner, Pat Poepsel, Rick Niedergeses	
From: John Smith	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: November 7, 2011	Field Report No: FR-084
RE: Key Distress Indicator #2	

Team Members:

HDR Representatives

John Smith
John Christiansen

Thiele Geotech Representatives

Steven
Josh

OPPD FCS Representatives

None

Field Activity Objective:

Observe Thiele Geotech during static cone penetrometer testing in the paved access area.

Activities Conducted:

Thiele Geotech performed static cone penetrometer tests (SCPT) on 38 holes which were one inch in diameter, spaced 10' apart as shown on the KDI #2 Forensic Investigation Plan Figure 1-1, and previously drilled by Leuder on 11/9/11. HDR observed these tests.

Data Obtained:

Documentation

Field notes taken are reflected in this report. No additional documentation recorded.

Visual and Photography

No photographs were taken.

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Discussions

Simple status updates were given to Ken Erdman and Phil Turner with OPPD throughout the day.

Technology

A hand operated static cone penetrometer was used by Thiele Geotech. Their report will provide additional information on the device used.

Other

Observations:

Holes 41, 39, 35-30, 25B and 15 were initially tested successfully along with additional tests at boring locations B-12, B-13 and B-14. The remaining holes were tried, but the presence of a stiff subbase or remaining concrete pavement prevented any testing. Leuder re-drilled these holes to the full 16" bit depth and testing resumed. Testing for the day was stopped at Hole 20 as some portion of the circulating water/discharge tunnel system was encountered and investigated. The remaining holes were tested on 11/8 with nothing additional to note.

Hole 20 is 39.5' west and 3' south of the northwest corner of the intake structure. This hole was originally tested at an approximate 8" drill depth with no advance. Leuder re-drilled the hole with a 16" bit and then it was re-tested. The SCPT was advanced to the hilt with the extension on, 79" total length, without encountering anything. The entire length of a 25' tape measure was inserted without encountering any resistance. The tape was wet 12' from the surface. A borescope was used but a clear picture could not be recorded. A concrete depth of 10.5" was recorded. An OPPD maintenance supervisor talked to the team during these activities and said Hole 20 is on top of a removable top of the discharge tunnel.

OPPD personnel described this as not unusual and though its location does not match existing drawings, Hole 20 is either on top of the north stop log shaft of the discharge tunnel or on top of a portion of the warm water recirculation system. HDR and OPPD investigated the hole on 11/8 with an OPPD borescope. A bottom was found at approximately 29' down (Elevation 975) matching the discharge tunnel bottom elevation.



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses		
From: John Smith	Project:	OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No:	164565, Dept. 134
Date: November 3, 2011	Field Report No:	FR-085
RE: OPPD FCS Key Distress Indicator Continued Monitoring		

Team Members:

HDR Representatives

John Christiansen – Geotechnical
John Smith – Civil

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.

Data Obtained:

Documentation

- None

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Daily checklist was completed.

Discussions

- No specific discussions of the results of the day's activities were made between HDR and OPPD representatives.

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OPPD00001353

Observations:

River elevation was about 993.3 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 70% full,
- West 6-inch line was about 25% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 10% full, and
- Time between pump cycles was about 115 seconds.

A 6" CPP flowing 5% full was discharging into the top of the sump.

A 1-inch hose was discharging into the floor drain inlet (southwest of TB3) along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

Maintenance Shop Column TE15 displacement between top of column and beam is about 2-5/16 inches.

Visual observations of note relative to previous observations were:

- The pavement at FP-3C had been replaced.
- A steel plate was installed over the gravel surfacing west of transformer T1A4.
- A 10' x 6' x 3'H pile of soil and sediment was removed from the cable trench near the northeast corner of vehicle gate number one.
- Landscaping rock and fabric were removed east of the Service Building, south of FP-145.
- Another crack in a TSC masonry wall was observed in Office No. 128 (Janitor's Closet – south wall).

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses	
From: Bryan Kumm	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: November 9, 2011	Field Report No: FR-104
RE: OPPD FCS Key Distress Indicator Continued Monitoring	

Team Members:

HDR Representatives

Bryan Kumm – Geotechnical
Hugh O'Grady – Civil
Cameron Collingsworth – Structural

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet
Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.

Data Obtained:

Documentation

- None

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of were obtained by using a digital camera.
- Daily checklist was completed.

Discussions

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OPPD00001355

- No specific discussions of the results of the day's activities were made between HDR and OPPD representatives.

Observations:

River elevation was about 993 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 50% full,
- West 6-inch line was about 10% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 10% full,
- A 4-inch flexible pipe about 5% full was discharging directly into the sump pit,
- Time between pump cycles was about 120 seconds,
- About 1-inch of water was flowing over the weir, and
- An approximately 2-foot diameter submersible pump had been lowered into the sump pit through the manhole opening.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

Maintenance Shop Column TE15 displacement between top of column and beam is about 2-1/8 inches.

Visual observations of note relative to previous observations were:

- Concrete had been placed around Fire Protection Cabinet FP-3C
- The void below the concrete pavement (east-southeast of MH-5) was full of water,
- The steel plates in the Paved Access Area had been removed and the exposed concrete appeared to be more severely damaged than prior to the placement of the steel plates,
- Surface water was ponding over most the distressed concrete in the Paved Access Area, and
- A crack appeared in the concrete panel southeast of High Mast Light 403.

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses		
From: Bryan Kumm	Project:	OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No:	164565, Dept. 134
Date: November 22, 2011	Field Report No:	FR-105
RE: OPPD FCS Key Distress Indicator Continued Monitoring		

Team Members:

HDR Representatives

Bryan Kumm – Geotechnical
Hugh O'Grady – Civil

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet
Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.
- Turbine Building South Switchyard CMU wall.
- Review cracked pavement around High Mast Light 403 just north of the Security Building

Data Obtained:

Documentation

- None

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of the areas were taken using a digital camera.
- Daily checklist was completed.

Discussions

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OPPD00001357

- No specific discussions of the results of the day's activities were made between HDR and OPPD representatives.

Observations:

River elevation was about 993 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 50% full,
- West 6-inch line was about 10% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 10% full,
- A 4-inch flexible pipe about 5% full was discharging directly into the sump pit,
- Time between pump cycles was about 126 seconds,
- About 1 to 2-inches of water was flowing over the weir, and
- An approximately 2-foot diameter submersible pump had been lowered into the sump pit through the manhole opening.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

Maintenance Shop Column MG-15 displacement between top of column and beam is about 2-1/8 inches.

Visual observations of note relative to previous observations were:

- The void below the concrete pavement (east-southeast of MH-5) was full of water,
- The water in the void appeared to be possibly flowing, and
- The concrete panel southeast of High Mast Light 403 appears to have subsided about 1/4-inch.

No cracks were observed in the CMU wall at the Turbine Building South Switchyard.

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses	
From: Bryan Kumm	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: December 8, 2011	Field Report No: FR-107
RE: OPPD FCS Key Distress Indicator Continued Monitoring	

Team Members:

HDR Representatives

Bryan Kumm – Geotechnical
Cameron Collingsworth – Structural

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet Service Building walls and floor at Elevation 1007 feet; and
- Technical Support Center walls and floor.
- Turbine Building South Switchyard CMU wall.
- Review cracked pavement around High Mast Light 403 just north of the Security Building

Data Obtained:

Documentation

- Daily checklist was completed.

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of the areas were taken using a digital camera.

Discussions

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OPPD00001359

- A request was made to Phil Turner to assist in determining the design capacity of each submersible pump in the Turbine Building Sump Pit.
- OCC personnel said that additional water was being discharged into the Turbine Building Sump Pit to provide enough water for the submersible pumps to operate continuously.
- Don Bock with OPPD said that Maintenance Shop Footing MG-15 will be underpinned with helical piles in 2012.

Observations:

River elevation was about 992.5 ft.

The ground surface was covered in snow except where it had been plowed.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 70% full,
- South 10-inch line was about 50% full,
- West 6-inch line was about 10% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 20% full,
- A 4-inch flexible pipe about 5% full was discharging directly into the sump pit,
- The dual alternating pumps were not operating,
- A large and a small submersible pump were pumping the water through a 6-inch and 2-inch hose, respectively,
- The hoses were discharging into the stop log chimney adjacent to the Intake Structure, and
- The submersible pumps had drawn the water down to about 1 foot below the top of the weir.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into a floor drain inlet along the 6-inch pipe that discharges through the north wall of the sump pit in the Turbine Building.

Maintenance Shop Column MG-15 displacement between top of column and beam is about 2-1/8 inches.

OPPD adjusted the shoring supporting the beam on Column Line 15. After adjusting the shoring, Maintenance Shop Column MG-15 displacement between top of column and beam was about 2½ inches.

Visual observations of note relative to previous observations were:

- The concrete pavement east-southeast of MH-5 was replaced,
- The concrete panel southeast of High Mast Light 403 could not be observed because it was covered in ice, and
- Lueder Construction was in the process of removing several concrete panels in the Paved Access Area.

No cracks, bowing, or other distress were observed in the CMU wall at the Turbine Building South Switchyard.

Three crack monitors had been installed on the horizontal crack in the Technical Support Center. The furthest south monitor indicated less than a 1/16 of an inch horizontal deflection. The other two monitors indicated no deflection.

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.

OPPD



Field Report

To: Keith Kirchner, John Christiansen, Rick Niedergeses	
From: Bryan Kumm	Project: OPPD FCS 2011 Flood Inundation Structure Assessment OPPD Plant, Ft. Calhoun, NE
CC: Project File, David Rohan	HDR Project No: 164565, Dept. 134
Date: December 22, 2011	Field Report No: FR-115
RE: OPPD FCS Key Distress Indicator Continued Monitoring	

Team Members:

HDR Representatives

Bryan Kumm – Geotechnical
Hugh O'Grady – Civil
Cameron Collingsworth – Structural

OPPD FCS Representatives

None

Field Activity Objective:

Visually observe Key Distress Indicators and surrounding areas as recommended in the Continued Monitoring Program.

Activities Conducted:

The following locations, as accessible, were visually observed as part of the Continued Monitoring Program:

- Key Distress Indicator #1 including the Turbine Building walls and floor at Elevation 990 feet;
- Key Distress Indicator #2 Paved Access Area; and
- Key Distress Indicator #3 including the Maintenance Shop walls and floor at Elevation 1007 feet Service Building walls and floor at Elevation 1007 feet; and Technical Support Center walls and floor.
- Turbine Building South Switchyard CMU wall.
- Review cracked pavement around High Mast Light 403 just north of the Security Building

Data Obtained:

Documentation

- Daily checklist was completed.

Visual and Photography

- Visual observations of site conditions were recorded in field.
- Photographs of the areas were taken using a digital camera.

Discussions

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OPPD00001362

- Josh Sweley (OPPD Systems Engineer) provided information on OPPD's progress in remediating the distress in the Maintenance Shop and Turbine Building.

Observations:

River elevation was about 989.7 ft.

Observations in the Turbine Building Sump were:

- South 6-inch line was about 30% full,
- South 10-inch line was about 10% full,
- West 6-inch line was about 10% full,
- West 10-inch line was about 0% full,
- North 6-inch line was about 5% full,
- The dual alternating pumps were back in operation, and
- Time between pump cycles was about 370 seconds.

Water could be observed flowing in the pipe under each floor drain inlet along the 6-inch pipe that discharges through the south wall of the sump pit in the Turbine Building.

A 1-inch hose was discharging into the floor drain inlet along the 6-inch pipe that discharges through the west wall of the sump pit in the Turbine Building.

Maintenance Shop Column MG-15 had shims placed in the gap between the top of the column and bottom of the beam. About 3 inches of shims were placed.

Hair line cracks have developed between the shoring and the elevator pit, between the shoring and the west wall and between the two furthest east shoring braces.

Cracks in the masonry walls have slightly increased in length.

The remaining concrete panels that had been removed in the Paved Access Area have been replaced,

No cracks, bowing, or other distress were observed in the CMU wall at the Turbine Building South Switchyard.

No additional movement was identified by the Technical Support Center crack monitors..

Other than the visual observations of note above, no new evidence of distress due to the 2011 Flood were observed.