DiabloCanyonNPEm Resource

From: Pick, Greg
Sent: Thursday, July 29, 2010 4:49 PM
To: pns3@pge.com
Subject: FW: Diablo Canyon Pull box
Attachments: OE white paper Electrical XI E3 Boxes.doc; Pull Box Layout.PDF

From: Davis, Rigel I [mailto:RND9@pge.com]
Sent: Wednesday, July 14, 2010 3:12 PM
To: greg.pick@nrc.gov
Subject: Diablo Canyon Pull box

Greg,

Attached is the Operating Experience Whitepaper for the DCPP pullboxes, and also the pullbox layouts.

Thank you,

Rye Davis
PG&E License Renewal
(623) 393-5225
rnd9@pge.com

<<OE white paper Electrical XI E3 Boxes.doc>> <<Pull Box Layout.PDF>>

Hearing Identifier: DiabloCanyon_LicenseRenewal_NonPublic
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From: Pick, Greg

Created By: Greg.Pick@nrc.gov

Recipients:
"pns3@pge.com" <pns3@pge.com>
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Diablo Canyon Power Plant

Operating Experience White Paper

XI.E3 Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Pull Boxes Subject to Water Intrusion and Collection

January 30 2010

1.0 Background

Most electrical cables in nuclear power plants are located in dry environments. However, some cables may be exposed to condensation and wetting in inaccessible locations, such as conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried installations. When an energized medium-voltage cable (2 kV to 35 kV) is exposed to wet conditions for which it is not designed, water treeing or a decrease in the dielectric strength of the conductor insulation can occur. This can potentially lead to electrical failure.

NUREG-1801 XI.E3, Medium Voltage Cable Aging Management, recommends periodic actions be taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection in cable pull boxes, and draining water, as needed. The above actions are not sufficient to assure that water is not trapped elsewhere in the raceways. For example, if duct bank conduit has low points in the routing, there could be potential for long-term submergence at these low points. In addition, concrete raceways may crack due to soil settling over a long period of time and pull box covers may not be watertight. Additionally, in certain areas, the water table is high in seasonal cycles and therefore, the raceways may get refilled soon after purging.

The purpose of the white paper is to describe the Diablo Canyon Power Plant (DCPP) monitoring and preventive maintenance programs that manage the collection of water in pull boxes that contain cables within the scope of XI.E3.

2.0 Scope

The program applies to inaccessible medium voltage cables within the scope of the license renewal that may be exposed to significant moisture simultaneous with significant voltage. Table 1 provides the complete list of inaccessible medium voltage cables not subject to 10 CFR 50.49 EQ requirements within the scope of the XI.E3 aging management program.

Table 1 In Scope Cables

Cable ID	Unit	From	To
F08H00A	1	BJA219	ASP1
F10H00	1	SHF10	SPF
F12H00	1	SHF12	CCWP1
G06H00A	1	BJA216	ASP2
G10H00	1	SHG10	SPG
G12H00	1	SHG12	CCWP2
H10H00	1	SHH10	SPH
H12H00	1	SHH12	CCWP3
TUV200A1	2	SVU23	THU22
TUV200A2	2	SVU23	THU22
TUV200A3	2	SVU23	THU22

Table 1 In Scope Cables			
Cable ID	**Unit**	**From**	**To**
TUV200B1	2	SVU23	THU22
TUV200B2	2	SVU23	THU22
TUV200B3	2	SVU23	THU22
TUV200C1	2	SVU23	THU22
TUV200C2	2	SVU23	THU22
TUV200C3	2	SVU23	THU22
F08H00A	2	BJA218	ASP1
F10H00	2	SHF10	THF10
F12H00	2	SHF12	CCWP1
G06H00A	2	BJA226	ASP2
G10H00	2	SHG10	THG10
G12H00	2	SHG12	CCWP2
H10H00	2	SHH10	THH10
H12H00	2	SHH12	CCWP3

3.0 Cable Operating Experience

PG&E letter DCL-07-053 describes cable failures experienced at DCPP related to inaccessible medium voltage cables. DCPP has experienced degraded insulation in 3 inaccessible medium voltage cables not subject to 10 CFR 50.49 EQ requirements. Although the cables did not fail in service the degradation required removing the affected loads from service to expedite repairs. The medium voltage cables were Okonite black ethylene propylene rubber (EPR) with tinned copper tape shield and Neoprene jacket purchased in 1972 from Okonite.

This list identifies each of the, in scope, inaccessible medium voltage cables that experienced in service degradation included in this program:

Date of Event	Circuit Number	Service to	Voltage
October 29, 1989	G06H00	ASW 2-2	4 kV
October 31, 1992	G06H00	ASW 1-2	4 kV
August 18, 2002	H12H00	CCW 2-3	4 kV

As discussed in DCL-07-053, definitive evidence of the causes of the failures of the cables to ASW 2-2 and ASW 1-2 was not found but DCPP suspects that water may have been a contributing factor to the degradation of the cable. The degradation of the CCW2-3 cable was attributed to discrete contaminant particles within the insulation material. Additionally 7 other cables failed to meet the acceptance criteria when tested. As a result of this determination, all original safety-related medium voltage cables have been replaced. (Corrective actions for Non Conformance Report (NCR) N0002150) Replacement cable is modern red EPR with tinned copper tape shield and Hypalon jacket.

4.0 Preventive Programs

As a result of the observed medium voltage cable degradation attributed at least in part to the presence of water, DCPP established outdoor electrical pull box water inspections in which pull boxes are pumped out to a maximum depth of 4 inches if water is found, drains are cleaned, and sump pumps and alarms are inspected. The inspection frequency is performed based on actual plant experience with water accumulation. In addition to water inspection of the electrical pull boxes, DCPP established a duct bank conduits inspection for the presence of water trapped behind conduit seals at the entrance of the building or due to being present in dips in the conduit where water does not drain as designed. Any conduit found with water is drained and monitored to verify that water does not return. The following is a summary of these programs.

4.1 Pull boxes in-scope

Table 3 provides a listing of the pull boxes within the scope of AMP XI.E3.

4.2 Pull Box inspections

4.2.1 Indoor Pull Boxes

During the cable replacement program the conduits were dried, cleaned, and inspected. Operating experience demonstrates that indoor pull boxes, in the auxiliary building and turbine buildings, are not subject to water intrusion. Electrical indoor pull boxes are not periodically inspected; however, some of the outdoor conduits entering these boxes were included in the conduit inspection population. Some conduits have been inspected for water collection, where cables do not obstruct access to the conduits.

- Electrical pull boxes BPG01-BPG06 are located in the auxiliary building (Area GW) and are not subject to water intrusion and accumulation. These pull boxes are designed with a drain in case water gets inside the pull boxes. Refer to drawing 57597 for Unit 1 and drawing 500732 for Unit 2.
- Electrical pull boxes BPO1-BPO11are located in the turbine building and are not subject to water intrusion and accumulation. These pull boxes are above floor level and are not structurally capable of retaining large accumulations of water. Additionally holes penetrate the fire barriers that separate the pull boxes from the room and each other. Drains have a downward slope that allows water to flow to a trench that collects the water from pull boxes and drains to a sump pit. Refer to drawing 438331 for Unit 1 and drawing 500606 for Unit 2.

4.2.2 Outdoor Pull Boxes

As a result of plant operating experience, with medium voltage cable degradation, DCPP created several programs to mitigate submergence of safety-related cables. All Pull boxes containing safety related medium voltage cable, located outdoors, are inspected for standing water. This includes all in scope medium voltage outdoor pull boxes. If more than 4 inches of water is found

in any pull box, it is pumped out to a maximum depth of 4 inches. The water pump is not capable of removing water from the pull box if it is less than 4 inches deep.
Pull boxes BPO13 to BPO20, located outside the Turbine Building, have been designed with a drain that prevents standing water in the pull box. Drained water flows through a conduit to a sump pump in a man hole adjacent to BPO13. Some instances of water accumulation have been documented. A high water level alarm on Unit 1 was reported on 11/11/1997. A visual inspection verified the high water level. The pull box sump was pumped out as a result of the alarm. On 10/17/2002 BPO13 for Unit 1 was discovered to have about 2' of standing water. The alarm failed to signal which led to the discovery of improper switch settings. As a result the actuation level for the alarm was reset. On 01/29/2003 both Unit 1 and Unit 2 BPO13 pull boxes contained water. Cables, not in the scope of license renewal, in both boxes were found submerged. Inspection indicated that the float for the alarm in Unit 1 was set significantly higher than it should be, resulting in no alarm until the cables were submerged. Action was taken to reset the levels on the alarm to the appropriate settings. A Unit 1 Sump Pump high level alarm on 11/11/2003 led to the discovery of 3' of water in the sump. The discharge line was blocked and the pump failed. As a result the discharge line was cleared and Manhole Sump Pump 1 was replaced. As of the last documented incident no alarms or pump failures have occurred, and the regularly scheduled maintenance is performed.

- These pull boxes are regularly scheduled for inspection by RT 47369 (now maintenance plan 12800) . During the dry season the system engineer can waive the inspection requirements. The sump pumps are inspected by RT 44855 (MP 12291) and RT 544858 (MP 18436) once per year refer to Table 6 and 7. Refer to drawing 438168 for Unit 1 and drawing 443001 for Unit 2.
- The remainder of the pull boxes, between the Turbine Building and Intake Structure including those within the scope of the XI.E3 program, are grouped in sets of pull boxes, for each unit. Every set of pull boxes is interconnected with a drainage gutter that collects water in a sump. The inspection program inspects, and if necessary pumps, the box with the inspection port. The cover for one box in each set of these boxes is provided with an access hole and cover for the purpose of inspection and pumping per the recurring task. RT 47369 (MP 12800) schedules inspection of these boxes every 2 months. The inspections can be deferred by the system engineer during the dry season and are conducted during the rainy season for indications of water intrusion. Pull boxes at the Intake Structure, BPZ40 to BPZ44, are designed with a drain to remove water. These pull boxes are inspected by RT 47399 (MP 12814) and RT 547399 (MP 18790) every other refueling outage. The drains are routed to the Intake sump. Refer to drawing 500817 for Unit 1 and drawing 500692 for Unit 2.

PGE Letter DCL-07-053 describes DCPP water intrusion inspections that are performed periodically to minimize or eliminate wet conditions.

4.3 Results of medium voltage pull box water inspections

The inspection and dewatering program at DCPP has been effective in keeping the pull boxes dry.

Table 2 lists all medium voltage pull box inspections scheduled from January 2000 thru January 2010. It identifies the inspections where water depth exceeded the maximum allowable for any pull box in the inspection. All in scope pull boxes are part of each inspection.

Table 3 provides the results of water inspections for all pull boxes within the scope of XI.E3. The table lists the work orders and where water collection was found in pull boxes in the scope of the XI.E3 aging management program. The period covers the time frame from January 2000 to January 2010.

4.4 One time inspection of duct bank conduits for presence of water

NCR 2188 corrective actions require the inspection of underground conduits, containing Raychem XLPE cables, suspected of containing water. The inspection looks for the presence of water and removes any water that is found. The conduit seals will also be removed, if possible, to dry out any water that may be located in dips in the conduits. If the seal cannot be removed a vent path is provided, if possible. Any conduits found to contain water will be monitored to verify the water does not return.

After inspection of the conduits is complete, one more inspection will be scheduled for conduits where water was found to verify that water has not returned to these conduits. If water is found in conduits, DCPP will conduct subsequent inspections to establish whether water intrusion is a recurrent problem. Table 4 shows the results of conduit inspections for inaccessible medium voltage cables not subject to 10 CFR 50.49 EQ requirements.

5.0 Conclusion

DCPP established a Safety Related medium voltage cable replacement program to ensure operability of the cable at the plant per NCR N0002150.

DCPP has several programs currently in place to minimize safety-related cable submergence. The plant performs pull box inspections and dewatering preventive maintenance for 4kV and 12kV underground electrical circuits located between the Turbine Building and the Intake Structure.

In the past DCPP experienced several water accumulation issues relating to the Sump Pumps. Appropriate action was taken to resolve these issues. As of 11/11/2003 no alarms or pump failures have occurred. The functionality and condition of sump pumps are verified annually.

The existing maintenance and inspection activities have been effective in limiting the exposure of in scope medium voltage cables to significant moisture. No water accumulation has been noted since spring of 2005, and no cables have been submerged, in pull boxes, for at least the last 10 years.

Experience has shown that the inspection programs established by DCPP have been effective in ensuring that medium voltage cables are not exposed to significant moisture. The operability of

in scope medium voltage cables will not be adversely affected by long term exposure to water collecting in associated pull boxes.

6. Open Items

6.1. Intake work plans change to 24 months or each cycle.
6.2. System Engineer will add a note to the RT 47369(Work Plan 12800) which will create a notification if water level found in the pull boxes is greater than 4 inches.
6.3. Determine completion date for conduit inspection.
6.4. Restore requirement to write notification if pumping is required – document cables / conduits covered (Y/N).

7 Reference

8.1 The following listing of drawing shows the construction configuration of pull boxes: drawings 437890, 438114, 438115, 438116, and 500820 (Unit 1) and drawings 443002, 500616, 438113 and 500820 (Unit 2). Unit 1 contains 3 sets of pull boxes between the Discharge Structure and the Intake Structure. The first set, located at coordinate D2 drawing 522196, consist of pull boxes BPO21, BPO39, BPO29 and BPO23. The second and third sets of pull boxes are located at coordinate C3. Pull boxes BPO22, BPO38, BPO35 and BPO34 are part of the second set of pull boxes and the third set consist of pull boxes BPO45, BPO44, BPO43 and BPO42. Unit 2 contains 2 sets of pull boxes, between the Discharge and Intake Structure, located at C4 (drawing 522196). The first set groups pull boxes BPO35, BPO34, BPO33 and BPO32. The second set contains pull boxes BPO45, BPO44, BPO43 and BPO42.

Table 2

Scheduled Pull boxes Inspections

	Date	W/O number	Water found
1.	2/18/00	R0203085	X
2.	5/24/00	R0205679	X
3.	07/12/00	R0208635	X
4.	9/6/00	R0209950	X
5.	2/2/01	R0211299	X
6.	4/13/01	R0217363	X
7.	6/26/01	R0219539	X
8.	8/23/01	R0223149	
9.	10/24/01	R0224833	
10	1/11/02	R0226821	X
11	4/26/02	R0228766	X
12	6/28/02	R0234755	
13	8/27/02	R0236993	
14	11/4/02	R0237255	
15	1/14/03	R0239570	X
16	3/10/03	R0241180	X
17	5/13/03	R0244457	
18	7/9/03	R0246571	
19	9/2/03	R0248466	
20	10/30/03	R0251555	
21	1/27/04	R0252516	
22	3/20/04	R0255453	X
23	7/16/04	R0257215	
24	9/7/04	R0262838	
25	10/25/04	R0264451	X
26	12/17/04	R0266340	X
27	2/10/05	R0269608	X
28	4/5/05	R0271478	X
29	6/7/05	R0273110	
30	10/21/05	R0274662	
31	12/15/05	R0278757	
32	1/12/06	R0282500	
33	3/24/06	R0283292	
34	6/2/06	R0285639	
35	7/27/06	R0289865	

36	9/26/06	R0291715	
37	1/18/07	R0295322	
38	3/22/07	R0298946	
39	5/18/07	R0299225	
40	7/12/07	R0401442	
41	10/29/07	R0304519	
42	12/26/07	R0308033	
43	2/27/08	R0310592	
44	4/21/08	R0312775	
45	6/11/08	R0315984	
46	7/29/08	R0318599	
47	10/20/08	R0319908	
48	9/28/08	50067928 64022497	
49	3/24/09	50067929 64022498	
50	6/2/09	50067930 64022499	
51	7/20/09	50067932 64022500	
52	9/28/09	50067933 64022502	
53	11/9/09	50094526 64029736	*
54	1/4/10	50197704 64032054	

* 2009 Results not yet available from RMS. Per planner no water was required to be pumped in 2009. This is expected due to extended dry period.

Table 3
Inspection Results for In-Scope
Pull Boxes only

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
1	BP013	R0203085	2/18/00	X		
		R0205679	5/24/00	X		
		R0208635	7/12/00	X		
		R0209950	9/6/00		X	
		R0211299	2/02/01	X		
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
1	BP016	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		50094526 64029736 50197704 64032054	11/9/09 1/4/10		X X	
1	BP019	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
1	BP025	R0203085	2/18/00	X		(1)
		R0205679	5/24/00	X		(1)
		R0208635	7/12/00	X		(1)
		R0209950	9/6/00	X		(1)
		R0211299	2/02/01	X		(2)
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02	X		>12" (3)
		R0228766	4/26/02	X		>12" (4)
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928	9/28/08		X	
		64022497				
		50067929	3/24/09		X	
		64022498				
		50067930	6/2/09		X	
		64022499				
		50067932	7/20/09		X	
		64022500				
		50067933	9/28/09		X	
		64022502				
		50094526	11/9/09		X	
		64029736				

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		50197704 64032054	1/4/10		X	
1	BP029C	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928	9/28/08		X	
		64022497				
		50067929	3/24/09		X	
		64022498				
		50067930	6/2/09		X	
		64022499				
		50067932	7/20/09		X	
		64022500				
		50067933	9/28/09		X	
		64022502				
		50094526	11/9/09		X	
		64029736				
		50197704	1/4/10		X	
		64032054				
1	BPO35C	R0203085	2/18/00	X		(1)
	BP038B	R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
1	BPO39B	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
1	BP043C BP044B	R0203085	2/18/00	X		(1)
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
1	BPZ42	R0272915	11/18/05		X	
		R0280284	05/04/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
1	BPZ43	R0272915	11/18/05		X	
		R0280284	05/04/07		X	
2	BP013	R0203085	2/18/00	X		(1)
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01	X		(2)
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928	9/28/08		X	
		64022497				
		50067929	3/24/09		X	
		64022498				
		50067930	6/2/09		X	
		64022499				
		50067932	7/20/09		X	
		64022500				
		50067933	9/28/09		X	
		64022502				
		50094526	11/9/09		X	
		64029736				
		50197704	1/4/10		X	
		64032054				
2	BP016	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
2	BP019	R0203085	2/18/00		X	
		R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03	X		>12"
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05	X		5"
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928	9/28/08		X	
		64022497				
		50067929	3/24/09		X	
		64022498				
		50067930	6/2/09		X	
		64022499				
		50067932	7/20/09		X	
		64022500				
		50067933	9/28/09		X	
		64022502				
		50094526	11/9/09		X	
		64029736				
		50197704	1/4/10		X	
		64032054				
2	BP025	R0203085	2/18/00	X		(1)
		R0205679	5/24/00		X	
		R0208635	7/12/00	X		(1)
		R0209950	9/6/00	X		(1)
		R0211299	2/02/01	X		(2)
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02	X		>12" (3)
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
2	BP033 BP033A	R0203085 R0205679	2/18/00 5/24/00	X	 X	(1)

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928	9/28/08		X	
		64022497				
		50067929	3/24/09		X	
		64022498				
		50067930	6/2/09		X	
		64022499				
		50067932	7/20/09		X	
		64022500				
		50067933	9/28/09		X	
		64022502				
		50094526	11/9/09		X	
		64029736				
		50197704	1/4/10		X	
		64032054				
2	BP043B	R0203085	2/18/00	X		(1)
	BP043C	R0205679	5/24/00		X	
		R0208635	7/12/00		X	
		R0209950	9/6/00		X	
		R0211299	2/02/01		X	
		R0217363	4/13/01		X	
		R0219539	6/26/01		X	
		R0223149	8/23/01		X	
		R0224833	10/24/01		X	
		R0226821	1/11/02		X	
		R0228766	4/26/02		X	
		R0234755	6/28/02		X	
		R0236993	8/27/02		X	
		R0237255	11/4/02		X	
		R0239570	1/14/03		X	
		R0241180	3/10/03		X	
		R0244457	5/13/03		X	
		R0246571	7/9/03		X	
		R0248466	9/2/03		X	
		R0251555	10/30/03		X	
		R0252516	1/27/04		X	
		R0255453	3/20/04		X	
		R0257215	7/16/04		X	
		R0262838	9/7/04		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
		R0264451	10/25/04		X	
		R0266340	12/17/04		X	
		R0269608	2/10/05		X	
		R0271478	4/5/05		X	
		R0273110	6/7/05		X	
		R0274662	10/21/05		X	
		R0278757	12/15/05		X	
		R0282500	1/12/06		X	
		R0283292	3/24/06		X	
		R0285639	6/2/06		X	
		R0289865	7/27/06		X	
		R0291715	9/26/06		X	
		R0295322	1/18/07		X	
		R0298946	3/22/07		X	
		R0299225	5/18/07		X	
		R0401442	7/12/07		X	
		R0304519	10/29/07		X	
		R0308033	12/26/07		X	
		R0310592	2/27/08		X	
		R0312775	4/21/08		X	
		R0315984	6/11/08		X	
		R0318599	7/29/08		X	
		R0319908	10/20/08		X	
		50067928 64022497	9/28/08		X	
		50067929 64022498	3/24/09		X	
		50067930 64022499	6/2/09		X	
		50067932 64022500	7/20/09		X	
		50067933 64022502	9/28/09		X	
		50094526 64029736	11/9/09		X	
		50197704 64032054	1/4/10		X	
2	BPZ42	R0272918	05/08/06		X	
		64013654	10/28/09		X	

Unit	Pull Box	RT/Work Order	Date	Water Found	No Water	Comments
2	BPZ43	R0272918 64013654	05/08/06 10/28/09		X X	

(1) Water detected and pumped. Volume/Depth not reported
(2) R0211299 did not identify which boxes required pumping.
(3) BP025 greater than 12" water. Cables not submerged. Not Pumped out.
(4) BP025 greater than 12" water. Cables not submerged. No record of pumping.

Table 4

Conduit Inspection Results

UNIT 1

Medium Voltage conduits from Intake to Turbine Building

ASW 11 Conduits							
Conduit	Length	From	To	AR	Outage	Dry/Wet	Comments
K1011	64'	ASW11	BPZ42	A0674957	1R14	Dry	Inspected the entire conduit from BPZ42 towards the motor
K0989	375'	BPO44B	BPZ42	A0674957	1R14	Dry	Inspected 96' from BPZ42 and 145' from BPO44B
K0800	350'	BPO38B	BPO44B	A0674957	1R14	Dry	Inspected 104' from BPO44B and 297' from BPO38B
K0776	600'	BPO39B	BPO38B	A0674957	1R14	Dry	Inspected 139' from BPO39B and 298' from BPO38B
K0670	440'	BPO19	BPO39B	A0674957	1R14	Dry	Inspected 114' from BPO39B and 89' from BPO19
ASW 12 Conduits							
Conduit	Length	From	To	AR	Outage	Dry/Wet	Comments
K1017	68'	ASW12	BPZ43	A0674957	1R14	Dry	Inspected 65' from BPZ43 towards the motor
K0983	375'	BPO43C	BPZ43	A0674957	1R14	Dry	Inspected 100' from BPZ43 and 190' from BPO43C
K0808	350'	BPO35C	BPO43C	A0674957	1R14	Dry	Inspected 174' from BPO43C and 152' from BPO35C
K0784	600'	BPO29C	BPO35C	A0674957	1R14	Dry	Inspected 161' from BPO35C and 95' from BPO29C
K0702	440'	BPO16	BPO29C	A0674957	1R14	Wet	Inspected 200' from BPO29C and found solid water from 15' to 70' and intermittent water from 100' to 200'. Most of the water was removed 0' to 100' (length of the hose). Minor liquid remains under the cables. Also inspected 210' from BPO16 and found solid water from 45' to 75' and intermittent water from 90' to 200'. Removed the water up to 113' from BPO16. A pocket of water remains in the conduit at about 175' from BPO16 that we could not get the hose to reach.

Medium Voltage Conduits from Auxiliary to Turbine Building

Bus F								
Conduit	Circuit	AR	Length	From	To	Outage	Dry/Wet	Comments
K0548	F09H00	A0584492	300'	BPG4	BPO7	1R14	dry	
K0549	F10H00	A0584493	300'	BPG4	BPO7	1R14	dry	
K0553	F12H00	A0584495	300'	BPG4	BPO7	1R14	dry	
Bus G								
Conduit	Circuit		Length	From	To	Outage	Dry/Wet	Comments
K0527	G07H00	A0580915	316'	BPG5	BPO4	1R15		
K0529	G10H00	A0580936	316'	BPG5	BPO4	1R15		
K0526	G12H00	A0580918	316'	BPG5	BPO4	1R15		
Bus H								
Conduit	Circuit		Length	From	To	Outage	Dry/Wet	Comments
K0503	H08H00	A0584499	350'	BPG6	BPO1	1R13	wet	K0503 had small sections of the conduit half full of water at distance 200’ and 250.
K0502	H09H00	A0584500	350'	BPG6	BPO1	1R13	dry	
K0505	H10H00	A0584505	350'	BPG6	BPO1	1R13	wet	K0505 had section half full of water at distance 130’
K0504	H12H00	A0584509	350'	BPG6	BPO1	1R13	wet	K0504 had section full of water at distance 226’ and 305’

Table 5. Intake Pull Box Inspections

Unit 1

Work Order	Pull Box	Date	Water Found	Additional Comments
R0272915	BPZ40	11/18/05	N	
R0280284	BPZ40	05/04/07	N	Problems noted with concrete spalling and conductor rack degradation. Reference AR # 695170 and 695173.
R0272915	BPZ41	11/18/05	N	
R0280284	BPZ41	05/04/07	N	Problems noted with concrete spalling and conductor rack degradation. Reference AR # 695170 and 695173.
R0272915	BPZ42	11/18/05	N	
R0280284	BPZ42	05/04/07	N	Problems noted with concrete spalling and conductor rack degradation. Reference AR # 695170 and 695173.
R0272915	BPZ43	11/18/05	N	
R0280284	BPZ43	05/04/07	N	Problems noted with concrete spalling and conductor rack degradation. Reference AR # 695170 and 695173.
R0272915	BPZ44	11/18/05	N	
R0280284	BPZ44	05/04/07	N	Problems noted with concrete spalling and conductor rack degradation. Reference AR # 695170 and 695173.

Unit 2

Work Order	Pull Box	Date	Water Found	Additional Comments
R0272918	BPZ40	05/08/06	N	All pull boxes show signs of rust staining on bottom 3' - 4' of vertical walls with varied spalling and cracking.
64013654	BPZ40	10/28/09	N	
R0272918	BPZ41	05/08/06	N	All pull boxes show signs of rust staining on bottom 3' - 4' of vertical walls with varied spalling and cracking.
64013654	BPZ41	10/28/09	N	
R0272918	BPZ42	05/08/06	N	All pull boxes show signs of rust staining on bottom 3' - 4' of vertical walls with varied spalling and cracking.
64013654	BPZ42	10/28/09	N	Concrete spalling SAPN 50278858
R0272918	BPZ43	05/08/06	N	All pull boxes show signs of rust staining on bottom 3' - 4' of vertical walls with varied spalling and cracking.
64013654	BPZ43	10/28/09	N	Concrete spalling SAPN 50278901
R0272918	BPZ44	05/08/06	N	All pull boxes show signs of rust staining on bottom 3' - 4' of vertical walls with varied spalling and cracking.
64013654	BPZ44	10/28/09	N	Concrete spalling in each of the sides of the box. SAPN 50279244

UNIT 2

Medium Voltage Conduit from Intake to Turbine Building

ASW 21 Conduits							
Conduit	Length	From	To	AR	Outage	Dry/Wet	Comments
K1011	71'	ASW11	BPZ42	A0675128	2R14	Dry	inspected 71' from BPZ42 to motor
K0989	350'	BPO43C	BPZ42	A0675128	2R14	Dry	Inspected 170' from BPO43C, and 93' from BPZ42
K0775	450'	BPO33C	BPO43C	A0675128	2R14	Dry	Inspected 137' from BPO33C and120' from BPO43C
K0670	440'	BPO19	BPO33C	A0675128	2R14	Dry	Inspected 133' from BPO19 and 127' from BPO33C
ASW 22 Conduits							

Conduit	Length	From	To	AR	Outage	Dry/Wet	Comments
K1017	50'	ASW22	BPZ43	A0675207	2R15		
K0984	350'	BPZ43	BP043B	A0675207	2R15		
K0784	450'	BPO43B	BPO33A	A0675207	2R15		
K0702	440'	BPO33A	BPO16	A0675207	2R15		
K2101	80'	BPO16	SWGR	A0675207	2R15		

Medium Voltage Conduit from Auxiliary to Turbine Building

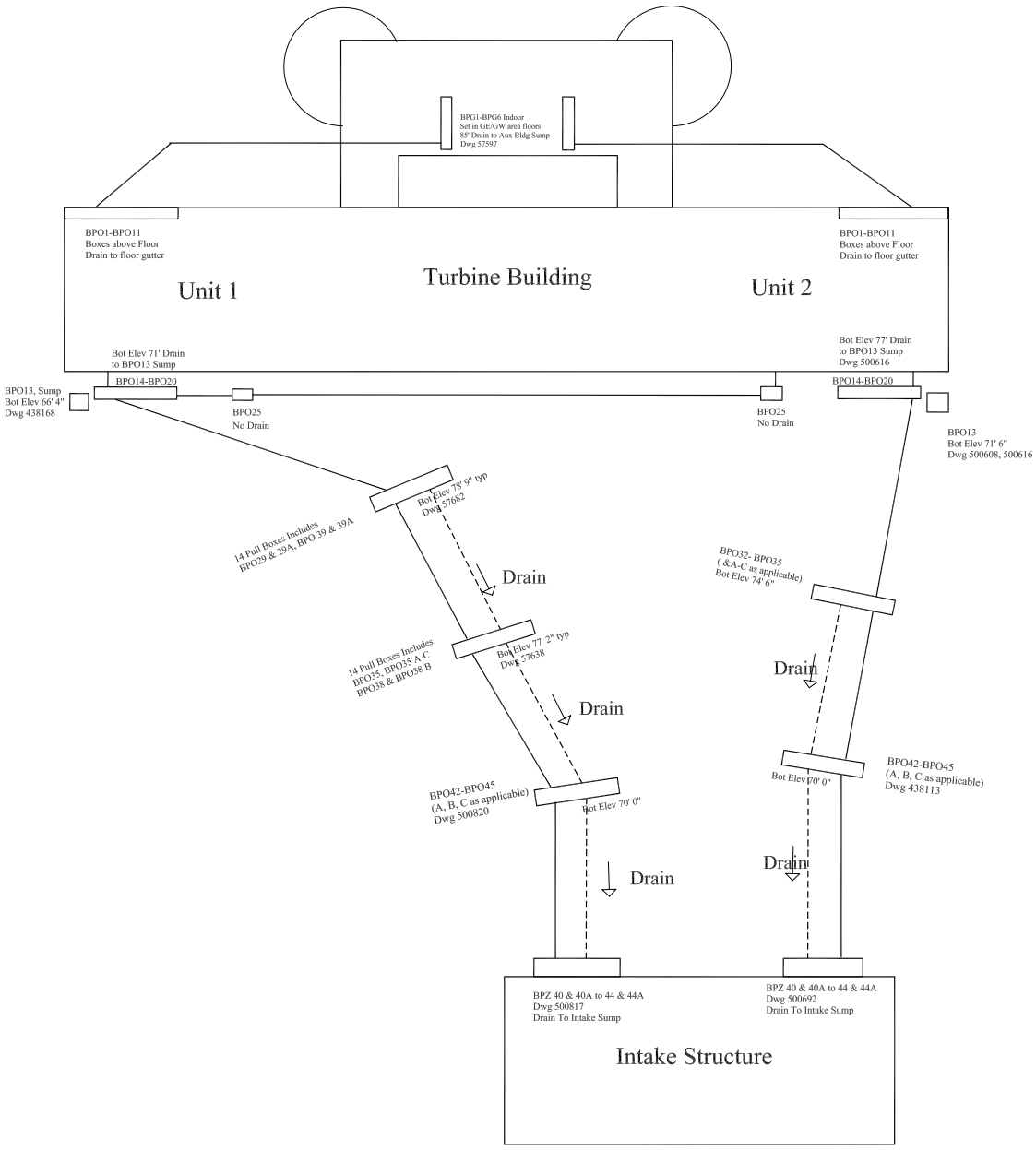
Bus F													
Conduit	Length	From	To	AR	Outage	Dry/Wet	Comments						
K0548	295'	BPO8	BPG4	A0584516	2R14	Dry*	AFW PP 2-3: Water in conduit dips at 5'-35', 175'-195' and 200'-250'						
K0549	295'	BPO8	BPG4	A0584517	2R14	Dry*	THF10: water in conduit dips at 12'-46', 123'-215', and 230'-251'						
K0553	295'	BPO8	BPG4	A0584522	2R14	Dry*	CCW PP 2-1: water in conduit dips at6'-53', 182-188', and 238'-264'						
							* Note: These conduits above were dry as the cables that were pulled out were found to be dry. The water found was after the conduits were washed and boroscoped to check for dips. These conduits were dried before new wires were pulled in.						
Bus G													
K0526	315'	BPO6	BPG5	A0580985	2R12		CCW PP 2-2						
K0527	315'	BPO6	BPG5	A0580976	2R12		CS PP 2-1						
K0532	315'	BPO6	BPG5	A0580980	2R12		CHG PP 2-2						
Bus H													
K0502	350'	BPO3	BPG6	A0584527	2R13	Wet	CS PP 2-2:- Water at 21'-30' in conduit dip						
K0503	350'	BPO3	BPG6	A0584526	2R13	Wet	AFW PP 2-2: Shallow water at (23'-36'), (159'-172'), and (262'-281') in conduit dips						
K0504	350'	BPO3	BPG6	A0665667	2R13	Dry	CCW PP 2-3						

Table 6. Unit 1 Sump Pump Inspections

Work Order	Sump Pump	Date Completed
R0226585	1-1	10/16/02
R0239199	1-1	10/02/03
R0253001	1-1	09/21/04
R0265375	1-1	09/13/05
R0278112	1-1	08/03/06
R0293096	1-1	08/16/07
64007443	1-1	10/28/09

Table 7. Unit 2 Sump Pump Inspections

Work Order	Sump Pump	Date Completed
R0198210	2-1	08/10/00
R0210875	2-1	07/25/01
R0224129	2-1	06/25/02
R0236131	2-1	06/25/03
R0249099	2-1	07/14/04
R0264791	2-1	06/30/05
R0275772	2-1	06/15/06
R0290617	2-1	05/30/07
R0304149	2-1	05/20/08
64013324	2-1	08/13/09


BPG1-BPG6 Indoor
Set in GE/GW area floors
85' Drain to Aux Bldg Sump
Dwg 57597
BPO1-BPO11
Boxes above Floor
Drain to floor gutter
Turbine Building
Unit 1
Unit 2
BPO1-BPO11
Boxes above Floor
Drain to floor gutter
Bot Elev 71' Drain
to BPO13 Sump
Bot Elev 77' Drain
to BPO13 Sump
Dwg 500616
BPO14-BPO20
BPO14-BPO20
BPO13, Sump
Bot Elev 66' 4"
Dwg 438168
BPO25
No Drain
BPO25
No Drain
BPO13
Bot Elev 71' 6"
Dwg 500608, 500616
Bot Elev 78' 9" typ
Dwg 57682
14 Pull Boxes Includes
BPO29 & 29A, BPO 39 & 39A
Drain
BPO32- BPO35
(&A-C as applicable)
Bot Elev 74' 6"
Bot Elev 77' 2" typ
Dwg 57638
14 Pull Boxes Includes
BPO35, BPO35 A-C
BPO38 & BPO38 B
Drain
Drain
BPO42-BPO45
(A, B, C as applicable)
Dwg 500820
Bot Elev 70' 0"
BPO42-BPO45
(A, B, C as applicable)
Dwg 438113
Bot Elev 70' 0"
Drain
Drain
BPZ 40 & 40A to 44 & 44A
Dwg 500817
Drain To Intake Sump
BPZ 40 & 40A to 44 & 44A
Dwg 500692
Drain To Intake Sump
Intake Structure