

Browse Responses

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

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Custom Value:

empty

IP Address:

167.236.220.11

Response Started:

Tuesday, March 15, 2011 10:28:25 AM

Response Modified:

Tuesday, March 15, 2011 10:34:38 AM

[Show this Page Only](#)

1. What is the name of your Company?

Waukesha Electric Systems

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

2

4. At these stations, how many spill events have you had in the last 10 years?

0

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - David L Harris

Address - 400 S. Prairie Ave, Waukesha, WI 53186

Phone and Fax Number - tel: 262-521-0166. FAX: 262-521-0191

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

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Custom Value:

empty

IP Address:

69.171.162.5

Response Started:

Monday, March 21, 2011 6:58:04 AM

Response Modified:

Monday, March 21, 2011 7:08:30 AM

[Show this Page Only](#)

1. What is the name of your Company?

Burns & McDonnell

2. What is your Company's primary classification?

General Interest

3. How many sub/switching stations exist on your system?

client based

4. At these stations, how many spill events have you had in the last 10 years?

0

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - Gary Engmann

Address - Burns & McDonnell

Phone and Fax Number - 8168224385

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

Alternative Fluids - 0

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 100

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - yes

Oil Circuit Breakers - no

Shunt Reactors - yes

Oil-Filled Cables (Including Terminal Stations) - no

Three Phase Regulators - yes

Single Phase Regulators - yes

Mobile Transformers - yes

Mobile Breakers - no

Mobile Regulators - yes

Mobile Substations - no

Oil Filling/Transporting Equipment - no

Station Service Transformers - no

Potential Transformers - no

Current Transformers - no

Oil Circuit Reclosers - no

Capacitor Banks - no

Above Ground Oil Storage Tanks - NA

Below Ground Oil Storage Tanks - NA

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Laws and regulations - yes

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit				
Fire Quenching & Oil Retention Pit				
Gravity Separator				
Oil-Water Separator				
Oil Trap				
Oil Absorbing Polymer Beads				
Perimeter or Equipment Berm				
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)	X	X	X	X
<i>Comments:</i> Burns & McDonnell				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

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Custom Value:

empty

IP Address:

12.180.166.130

Response Started:

Wednesday, March 23, 2011 12:53:22 PM

Response Modified:

Wednesday, March 23, 2011 12:54:05 PM

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1. What is the name of your Company?

No Response

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

No Response

4. At these stations, how many spill events have you had in the last 10 years?

No Response

5. Of these spills how many extended outside the property boundaries?

No Response

6. Who should we contact if any clarifications are required?

No Response

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the

following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

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Custom Value:

empty

IP Address:

12.180.166.130

Response Started:

Thursday, March 24, 2011 5:18:32 AM

Response Modified:

Thursday, May 26, 2011 9:02:27 AM

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1. What is the name of your Company?

American Transmission

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

approx 500

4. At these stations, how many spill events have you had in the last 10 years?

Based on spill records kept since 2005, ATC has had approx. 40 spills at substations. 19 spills have been less than 5 gallons (reporting threshold for WDNR) 21 spills have been greater than or equal 5 gallons most ranging from 25-100 gallons.

5. Of these spills how many extended outside the property boundaries?

4

6. Who should we contact if any clarifications are required?

Name - Nayo Parrett

Address - PO BOX 47 WALIKESHA WISC 53187

Address - PO BOX 47 WAUKESHA, WIS 53187

Phone and Fax Number - 262-506-6788 262-506-6939

E-Mail - nparrett@atcllc.com

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

Alternative Fluids - 0

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 100

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - yes

Oil Circuit Breakers - no

Shunt Reactors - yes

Three Phase Regulators - n/a

Single Phase Regulators - n/a

Mobile Breakers - n/a

Mobile Regulators - n/a

Mobile Substations - n/a

Station Service Transformers - no

Potential Transformers - no

Current Transformers - no

Oil Circuit Reclosers - n/a

Capacitor Banks - no

Above Ground Oil Storage Tanks - yes

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - we look at transformers for engineered containment

Total volume of oil in substation - 1320 gallons

Proximity to navigable waters - yes with 200ft of navigatable waters

Location of substation (urban, rural, etc) - no

Potential contamination of groundwater - yes

Age of station or equipment - yes

Emergency response time if a spill occurs - yes

Failure probability of the equipment - yes

Soil characteristics at and near the station - yes

Laws and regulations - yes

Cost of containment vs. cost of cleanup - no

Software analysis - by consultant only

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective Retrofit Installations	Effective
Open Oil Retention Pit	X		
Fire Quenching & Oil Retention Pit	X		
Gravity Separator			
Oil-Water Separator			
Oil Trap			
Oil Absorbing Polymer Beads	X		
Perimeter or Equipment Berm	X		
Oil Detection-Triggered Sump Pump			
Oil-Water Stop Valve			
Other (please describe)			

Comments:

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -100%

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - yes plus 100 year 24 hour storm

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - 10 foot skirt around equipment foundation

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - n/a

Do you evaluate the soil characteristics to determine if the pit should be lined? - consultant considers

If yes, what soil characteristic criteria are used to determine if a lining is necessary? - up to consultant to decide

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner		X		
Spray-On Liner				
Clay (Bentonite)			X	
Concrete		X		
Others (please specify)				

Comments:

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - not a consideration

Design void ratio for oil containment volume? - 40%

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand	X	X

Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck	X	
Soil Removal	X	X
Other (please describe)		
<i>Comments: American Transmission</i>		

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

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Custom Value:

empty

IP Address:

208.186.200.6

Response Started:

Monday, March 28, 2011 1:44:41 PM

Response Modified:

Monday, March 28, 2011 1:47:30 PM

[Show this Page Only](#)

1. What is the name of your Company?

PacifCorp/Rocky Mountain Power

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

1000+

4. At these stations, how many spill events have you had in the last 10 years?

Others keep track

5. Of these spills how many extended outside the property boundaries?

Others keep track

6. Who should we contact if any clarifications are required?

Name - Scott Greenberg

Address - 1407W North Temple NTO 230

Phone and Fax Number - 801-220-4534

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

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Custom Value:

empty

IP Address:

204.126.92.108

Response Started:

Wednesday, March 30, 2011 2:07:18 PM

Response Modified:

Wednesday, March 30, 2011 2:16:01 PM

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1. What is the name of your Company?

Wisconsin Public Service

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

203

4. At these stations, how many spill events have you had in the last 10 years?

1-2

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - Don Wengertter

Address - 700 North Adams Green Bay WI 54307

Phone and Fax Number - 920-433-1706 920-433-1009

E-Mail - dewengertter@wisconsinpublicservice.com

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 90

Human Error - 10

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - yes- Hish risk sites such as hydro generators on case by case

Oil Circuit Breakers - no

Shunt Reactors - no

Oil-Filled Cables (Including Terminal Stations) - no

Three Phase Regulators - no

Single Phase Regulators - no

Mobile Transformers - no

Mobile Breakers - no

Mobile Regulators - no

Mobile Substations - no

Oil Filling/Transporting Equipment - no

Station Service Transformers - no

Potential Transformers - no

Current Transformers - no

Oil Circuit Reclosers - no

Capacitor Banks - no

Above Ground Oil Storage Tanks - yes

Below Ground Oil Storage Tanks - no

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Proximity to navigable waters - mangement decision

Emergency response time if a spill occurs - one site 4 hours from service territory (wind farm)

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective Retrofit Installations	Effective
Open Oil Retention Pit	X	X	
Fire Quenching & Oil Retention Pit			
Gravity Separator			
Oil-Water Separator			
Oil Trap			
Oil Absorbing Polymer Beads			X
Perimeter or Equipment Berm			X
Oil Detection-Triggered Sump Pump			
Oil-Water Stop Valve			
Other (please describe)	X	X	
<i>Comments: Wisconsin Public Service</i>			

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -110

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - yes- 25 year rain event

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - depends on volume required and site. Not designing for a spray from a puncture

Do you evaluate the soil characteristics to determine if the pit should be lined? - yes

If yes, what soil characteristic criteria are used to determine if a lining is necessary? - always line

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
--	------	-------------	------------------	-----------

Rubber Liner				
Plastic Liner				
Geomembrane Liner		X	X	X
Spray-On Liner				
Clay (Bentonite)	X			
Concrete		X		
Others (please specify)				
<i>Comments:</i>				

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - not sure. Pits are allowed to fill most of the way

Design void ratio for oil containment volume? - 40% void

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector	X	X
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand	X	X
Berm Cleanup	X	X
Dike on Sloped Ground	X	X
Stone Vacuum Truck	X	X
Soil Removal	X	X
Other (please describe)		
<i>Comments:</i>		

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Response Type:
Normal Response

Collector:
IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

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Custom Value:
empty

IP Address:
4.79.200.34

Response Started:
Monday, April 4, 2011 7:50:48 AM

Response Modified:
Thursday, November 10, 2011 11:33:48 AM

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1. What is the name of your Company?

Progress Energy

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

approximately 500

4. At these stations, how many spill events have you had in the last 10 years?

5 or so. I'm going on memory and don't have the data available.

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - Robert Holsonback

Address - 299 First Avenue North, St. Petersburg, FL 33701

Phone and Fax Number - (727) 820-5274

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

Show this Page Only

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

12.106.168.131

Response Started:

Monday, April 4, 2011 12:16:07 PM

Response Modified:

Monday, April 4, 2011 12:58:59 PM

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1. What is the name of your Company?

ITC Holdings Corp

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

500-600

4. At these stations, how many spill events have you had in the last 10 years?

approximately 100, most minor in nature

5. Of these spills how many extended outside the property boundaries?

None; a couple have made their way to the permitter drainage ditch which was still on our actual property.

6. Who should we contact if any clarifications are required?

Name - Mike McNulty

Address - 27175 Energy Way, Novi, MI 48377

Phone and Fax Number - (248) 946-3392

E-Mail - mmcnulty@itctransco.com

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 99

Alternative Fluids - 1

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 80

Vandalism - 0

Human Error - 20

Other (Please explain in comments at end of survey) - 0

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - We provide containment for all power transformers (we operate 34.5 kV and above; most is 69 kV -345 kV)

Oil Circuit Breakers - We retro-fit containment around OCBs where they are next to underdrains, adjacent to fencelines, etc. Otherwise, we rely on may if containment does not already exist

Shunt Reactors - Yes - all oil-filled reactors

Oil-Filled Cables (Including Terminal Stations) - No containment on cables themselves, but we do provide secondary containment on pumping stations

Three Phase Regulators - N/A

Single Phase Regulators - N/A

Mobile Transformers - N/A

Mobile Breakers - N/A

Mobile Regulators - N/A

Mobile Substations - N/A

Oil Filling/Transporting Equipment - No containment provided on processing trailer or for hoses; but do stage frac tanks/tankers inside mobile containment

Station Service Transformers - Very rarely

Station Service Transformers - Very rarely

Potential Transformers - Rarely, but we may provide drainage controls if underdrains are adjacent to PTs

Current Transformers - Rarely, but we will provide drainage controls if underdrains are adjacent to CTs

Oil Circuit Reclosers - N/A

Capacitor Banks - No containment provided

Above Ground Oil Storage Tanks - Yes - all ASTs are equipped with containment and/or are double-walled

Below Ground Oil Storage Tanks - Yes, all USTs have double-walled.

Other (Please Describe) - N/A

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - Yes but no definitive threshold defined

Total volume of oil in substation - No

Proximity to navigable waters - Yes but no definitive distance defined

Location of substation (urban, rural, etc) - Yes - proximity to sensitive environmental receptors

Potential contamination of groundwater - Yes

Age of station or equipment - No

Emergency response time if a spill occurs - Yes

Failure probability of the equipment - Yes - primarily power transformers versus OCBs and other oil-filled equipment

Soil characteristics at and near the station - Yes

Laws and regulations - Yes

Cost of containment vs. cost of cleanup - No

Software analysis - No

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit	X	X		
Fire Quenching & Oil Retention Pit	X	X	X	X
Gravity Separator				
Oil-Water Separator	X			
Oil Trap	X			

Oil trap				
Oil Absorbing Polymer Beads	X	X	X	
Perimeter or Equipment Berm				
Oil Detection-Triggered Sump Pump	X	X	X	X
Oil-Water Stop Valve			X	
Other (please describe)				
<i>Comments:</i> ITC Holdings Corp				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? - 110% on average (rule of thumb criteria we have used as substitute for 25 year 24-hr storm)

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - Yes - see above

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - For new installs, at least 10 -15 feet

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - 4-5 feet

Do you evaluate the soil characteristics to determine if the pit should be lined? - Yes

If yes, what soil characteristic criteria are used to determine if a lining is necessary? - Effectively impervious clays (10^{-3} cm/s hydraulic conductivity)

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner				
Spray-On Liner	X	X	X	X
Clay (Bentonite)	X		X	X
Concrete	X	X		X
Others (please specify)	X			
<i>Comments:</i> ITC Holdings Corp				

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - Do not know

Design void ratio for oil containment volume? - 30-40%

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector	X	X
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand		
Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck	X	X
Soil Removal	X	X
Other (please describe)		

Comments: ITC Holdings Corp

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
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Custom Value:

empty

IP Address:

70.162.147.2

Response Started:

Monday, April 18, 2011 3:55:34 PM

Response Modified:

Monday, April 18, 2011 4:13:12 PM

[Show this Page Only](#)

1. What is the name of your Company?

Salt River Project

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

~200

4. At these stations, how many spill events have you had in the last 10 years?

2

5. Of these spills how many extended outside the property boundaries?

1

6. Who should we contact if any clarifications are required?

Name - Thomas LaRose, P.E.

Address - 998 W Washington, Phoenix, AZ 85281

Phone and Fax Number - v: 602-236-3741 f: 602-681-2733

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 99

Alternative Fluids - 1

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 100

Vandalism - 0

Human Error - 0

Other (Please explain in comments at end of survey) - 0

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - 10 MVA and above

Oil Circuit Breakers - none

Shunt Reactors - all

Oil-Filled Cables (Including Terminal Stations) - n/a

Three Phase Regulators - n/a

Single Phase Regulators - n/a

Mobile Transformers - none

Mobile Breakers - n/a

Mobile Regulators - n/a

Mobile Substations - none

Oil Filling/Transporting Equipment - none

Station Service Transformers - 1 MVA

Potential Transformers - only if positioned in water retention areas

Current Transformers - none

Oil Circuit Reclosers - n/a

Capacitor Banks - none

Above Ground Oil Storage Tanks - all

Below Ground Oil Storage Tanks - n/a

Other (Please Describe) - n/a

Show this Page Only

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - >500 gal.

Proximity to navigable waters - drainage to water

Location of substation (urban, rural, etc) - all

Potential contamination of groundwater - all

Age of station or equipment - any

Emergency response time if a spill occurs - all

Failure probability of the equipment - all

Soil characteristics at and near the station - determines if a lined pit is used

Laws and regulations - n/a

Cost of containment vs. cost of cleanup - n/a

Software analysis - n/a

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit			X	
Fire Quenching & Oil Retention Pit	X	X	X	X
Gravity Separator				
Oil-Water Separator				
Oil Trap				
Oil Absorbing Polymer Beads				
Perimeter or Equipment Berm				
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)				

Comments:

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -150% for new installations, oil plus rain runoff

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - 50% freeboard

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - minimum half the height of the oil tank

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - n/a

Do you evaluate the soil characteristics to determine if the pit should be lined? - yes

If yes, what soil characteristic criteria are used to determine if a lining is necessary? - percolation rates (specific value not available at this time)

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner	X	X		
Spray-On Liner				
Clay (Bentonite)				
Concrete	X	X	X	
Others (please specify)				
<i>Comments: Salt River Project</i>				

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - 6"

Design void ratio for oil containment volume? - depends on the rock size, for 1" river rock ,30% void is used.

Show this Page Only

15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
--	------	-----------

River Boom Deflector

Straw Skimming

Expanded Straw Skimming

Lake Boom Deflector

Cover with Sand

Berm Cleanup

Dike on Sloped Ground

Stone Vacuum Truck

Soil Removal

X

X

Other (please describe)

Comments:

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
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Custom Value:

empty

IP Address:

204.124.193.191

Response Started:

Thursday, April 28, 2011 12:29:30 PM

Response Modified:

Thursday, April 28, 2011 3:04:00 PM

[Show this Page Only](#)

1. What is the name of your Company?

MidAmerican Energy Company

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

400

4. At these stations, how many spill events have you had in the last 10 years?

3

5. Of these spills how many extended outside the property boundaries?

None

6. Who should we contact if any clarifications are required?

Name - Steve Haacke

Address - 102 E. Second Street, Davenport, IA 52801

Phone and Fax Number - 563-333-8388. 563-333-8112

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

Alternative Fluids - 0

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 100

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - Yes, all power transformers

Oil Circuit Breakers - Yes, 69 kV and higher voltages

Shunt Reactors - Yes, all

Oil-Filled Cables (Including Terminal Stations) - No

Three Phase Regulators - Yes, all

Single Phase Regulators - Yes, all

Mobile Transformers - NA

Mobile Breakers - NA

Mobile Regulators - Yes, all

Mobile Substations - Yes, all

Oil Filling/Transporting Equipment - Yes, all

Station Service Transformers - No

Potential Transformers - No

Current Transformers - No

Oil Circuit Reclosers - No

Capacitor Banks - No

Above Ground Oil Storage Tanks - Yes

Below Ground Oil Storage Tanks - NA

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - >55 gal but depends on location within sub

Total volume of oil in substation - >1320 gal

Proximity to navigable waters - Yes

Location of substation (urban, rural, etc) - No

Potential contamination of groundwater - Yes

Age of station or equipment - No

Emergency response time if a spill occurs - No

Failure probability of the equipment - No

Soil characteristics at and near the station - No

Laws and regulations - Yes

Cost of containment vs. cost of cleanup - No

Software analysis - No

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit				
Fire Quenching & Oil Retention Pit	X	X	X	X
Gravity Separator				
Oil-Water Separator				
Oil Trap				
Oil Absorbing Polymer Beads				
Perimeter or Equipment Berm			X	X
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)				
<i>Comments:</i>				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the

selected percentage based on? -100% plus 6" for rain water allowance _____

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - Yes, see above

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - Varies, at least 2 feet

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - Varies, at least 2 feet

Do you evaluate the soil characteristics to determine if the pit should be lined? - No, all pits are lined

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner	X	X	X	X
Spray-On Liner				
Clay (Bentonite)				
Concrete	X			X
Others (please specify)				

Comments:

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - Varies

Design void ratio for oil containment volume? - 40%

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand		

Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck		
Soil Removal	X	X
Other (please describe)	X	X
<i>Comments: MidAmerican Energy Company</i>		

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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Custom Value:

empty

IP Address:

138.226.68.8

Response Started:

Thursday, May 12, 2011 12:43:29 PM

Response Modified:

Thursday, May 12, 2011 1:42:38 PM

[Show this Page Only](#)

1. What is the name of your Company?

ABB Power Systems

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

We deliver approx. 10 to 15 turnkey sub/switching station projects a year to various customers.

4. At these stations, how many spill events have you had in the last 10 years?

none

5. Of these spills how many extended outside the property boundaries?

none

6. Who should we contact if any clarifications are required?

Name - Paason Rojanatavorn

Address - 940 Main Campus Drive, Suite 400, Raleigh NC 27612

Phone and Fax Number - 919-807-5086

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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(Web Link)

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Custom Value:

empty

IP Address:

206.227.160.13

Response Started:

Friday, May 20, 2011 6:30:48 AM

Response Modified:

Monday, June 6, 2011 12:04:46 PM

[Show this Page Only](#)

1. What is the name of your Company?

Oncor Electric Delivery Company

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

1700

4. At these stations, how many spill events have you had in the last 10 years?

463

5. Of these spills how many extended outside the property boundaries?

8 4 of these are underground transmission related

6. Who should we contact if any clarifications are required?

Name - Thomas Yamin

Address - 115 W. Seventh Street, Fort Worth, TX 76102

Phone and Fax Number - 817-876-8432. FAX 817-215-6959

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 99

Alternative Fluids - 1

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 95

Vandalism - 3

Human Error - 2

Other (Please explain in comments at end of survey) - 0

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - 69 kV or greater, 50 gallons or more of oil

Oil Circuit Breakers - 138 kV or greater, 50 gallons or more of oil

Shunt Reactors - 100 MVA or greater, 50 gallons or more of oil

Oil-Filled Cables (Including Terminal Stations) - 138 kV or greater

Mobile Transformers - 69 kV or greater, 50 gallons or more of oil

Oil Filling/Transporting Equipment - 69 kV or greater, 50 gallons or more of oil

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - Greater than 50 gallons.

Proximity to navigable waters - Less than 1000 feet

Location of substation (urban, rural, etc) - Less than 1000 feet

Potential contamination of groundwater - Yes

Age of station or equipment - No

Emergency response time if a spill occurs - Yes

Failure probability of the equipment - No

Soil characteristics at and near the station - No

Laws and regulations - Yes

Cost of containment vs. cost of cleanup - Yes

Software analysis - In some substations

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit	X	X		
Fire Quenching & Oil Retention Pit				
Gravity Separator				
Oil-Water Separator	X	X	X	X
Oil Trap				
Oil Absorbing Polymer Beads	X	X	X	X
Perimeter or Equipment Berm	X	X	X	X
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)				
<i>Comments:</i> Oncor Electric Delivery Company				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -Unknown, these are old designs

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner				
Spray-On Liner				

Clay (Bentonite)				
Concrete				
Others (please specify)	X	X	X	X
<i>Comments:</i> Oncor Electric Delivery Company				

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - 2" depth of 1" diameter rock, not designed for suppression

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand		
Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck		
Soil Removal	X	X
Other (please describe)		
<i>Comments:</i> Oncor Electric Delivery Company		

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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Custom Value:

empty

IP Address:

63.77.247.10

Response Started:

Friday, October 14, 2011 5:40:16 AM

Response Modified:

Monday, March 5, 2012 7:43:12 AM

[Show this Page Only](#)

1. What is the name of your Company?

DTE Energy

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

Approx 750

4. At these stations, how many spill events have you had in the last 10 years?

Approx 50

5. Of these spills how many extended outside the property boundaries?

Approx 10

6. Who should we contact if any clarifications are required?

Name - Jim Rachwal

Address - One Energy Plaza, 655 GO

Phone and Fax Number - 313.235.6524

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 95

Alternative Fluids - 5

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 50

Vandalism - 2

Human Error - 3

Other (Please explain in comments at end of survey) - 45

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - Approx 80%

Mobile Substations - 100%

Station Service Transformers - 30%

Above Ground Oil Storage Tanks - 100%

Below Ground Oil Storage Tanks - 60%

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Total volume of oil in substation - 1320

Proximity to navigable waters - Impact to

Location of substation (urban, rural, etc) - Impact to Nav Water

Potential contamination of groundwater - Impact to Nav Water

Emergency response time if a spill occurs - Impact to Nav Water

Failure probability of the equipment - Impact to Nav Water

Soil characteristics at and near the station - Impact to Nav Water

Laws and regulations - Impact to Nav Water

Software analysis - Use MOSES

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective Retrofit Installations	Effective
Open Oil Retention Pit			
Fire Quenching & Oil Retention Pit			
Gravity Separator	X		X
Oil-Water Separator	X		X
Oil Trap			
Oil Absorbing Polymer Beads	X		X
Perimeter or Equipment Berm	X		X
Oil Detection-Triggered Sump Pump	X		X
Oil-Water Stop Valve	X		X
Other (please describe)			

Comments:

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -110% + Freeboard

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - yes, 25 year, 24 storm event

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - typically 10 feet

Do you evaluate the soil characteristics to determine if the pit should be lined? - yes

If yes, what soil characteristic criteria are used to determine if a lining is necessary? - peramability

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner	X	X		
Plastic Liner	X	X		

Geomembrane Liner	X	X
Spray-On Liner	X	X
Clay (Bentonite)	X	X
Concrete	X	X
Others (please specify)		
<i>Comments:</i>		

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - yes,

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector	X	X
Straw Skimming		
Expanded Straw Skimming		X
Lake Boom Deflector	X	X
Cover with Sand	X	X
Berm Cleanup	X	X
Dike on Sloped Ground	X	X
Stone Vacuum Truck	X	X
Soil Removal	X	X
Other (please describe)	X	X
<i>Comments:</i> DTE Energy		

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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Custom Value:

empty

IP Address:

65.121.155.222

Response Started:

Monday, October 31, 2011 4:13:21 AM

Response Modified:

Monday, October 31, 2011 4:30:27 AM

[Show this Page Only](#)

1. What is the name of your Company?

Progress Energy

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

~ 600

4. At these stations, how many spill events have you had in the last 10 years?

two or three significant spills

5. Of these spills how many extended outside the property boundaries?

one maybe two.

6. Who should we contact if any clarifications are required?

Name - Don Russell

Phone and Fax Number - 546.546.5885

E-Mail - donald.russell@panmail.com

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 50

Vandalism - 50

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - 50 gal

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
--	-------------------	-----------	------------------------	-----------

Open Oil Retention Pit				
------------------------	--	--	--	--

Fire Quenching & Oil Retention Pit		X		
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Gravity Separator				
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Oil-Water Separator				
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Oil Trap				
----------	--	--	--	--

Oil Absorbing Polymer Beads				
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Perimeter or Equipment Berm				X
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Oil Detection-Triggered Sump Pump

Oil-Water Stop Valve

X

X

Other (please describe)

Comments: Progress Energy

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -100% plus 100 year rain fall event

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner		X		
Plastic Liner				
Geomembrane Liner				
Spray-On Liner				
Clay (Bentonite)				
Concrete		X		
Others (please specify)				
Comments: Progress Energy				

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - 3 feet

Design void ratio for oil containment volume? - 40%

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		

Cover with Sand

Berm Cleanup

X

Dike on Sloped Ground

Stone Vacuum Truck

Soil Removal

X

Other (please describe)

Comments:

Browse Responses

Displaying **15** of **26** respondents

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

204.61.48.20

Response Started:

Monday, March 26, 2012 11:47:03 AM

Response Modified:

Monday, March 26, 2012 11:48:38 AM

[Show this Page Only](#)

1. What is the name of your Company?

Puget Sound Energy

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

>450

4. At these stations, how many spill events have you had in the last 10 years?

<50

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - John Rork

Address - P.O. Box 90868 PSE-11N

Phone and Fax Number - 425 456-2228

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Displaying **16** of **26** respondents

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

192.212.253.129

Response Started:

Tuesday, May 1, 2012 4:37:06 PM

Response Modified:

Tuesday, May 1, 2012 4:44:50 PM

[Show this Page Only](#)

1. What is the name of your Company?

Southern California Edison

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

~1200

4. At these stations, how many spill events have you had in the last 10 years?

~50

5. Of these spills how many extended outside the property boundaries?

~5

6. Who should we contact if any clarifications are required?

Name - Mark Passarini

Address - 1218 S 5th Ave, Monrovia, CA 91016

Phone and Fax Number - 626-462-8728

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 50

Vandalism - 50

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - nearly all are generally contained

Oil Circuit Breakers - nearly all are generally contained

Shunt Reactors - nearly all are generally contained

Oil-Filled Cables (Including Terminal Stations) - nearly all are generally contained

Three Phase Regulators - nearly all are generally contained

Single Phase Regulators - nearly all are generally contained

Mobile Transformers - nearly all are generally contained

Mobile Breakers - nearly all are generally contained

Mobile Regulators - nearly all are generally contained

Mobile Substations - nearly all are generally contained

Oil Filling/Transporting Equipment - nearly all are generally contained

Station Service Transformers - nearly all are generally contained

Potential Transformers - nearly all are generally contained

Current Transformers - nearly all are generally contained

Oil Circuit Reclosers - nearly all are generally contained

Capacitor Banks - nearly all are generally contained

Above Ground Oil Storage Tanks - all are double wall or secondarily contained

Below Ground Oil Storage Tanks - all are double wall

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

15. Which of the following oil spill cleanup methods do you employ?

No Response

Browse Responses

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

152.85.8.33

Response Started:

Tuesday, May 1, 2012 5:01:14 PM

Response Modified:

Tuesday, May 1, 2012 5:14:20 PM

[Show this Page Only](#)

1. What is the name of your Company?

Tennessee Valley Authority

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

>500

4. At these stations, how many spill events have you had in the last 10 years?

None that reached waters of the US

5. Of these spills how many extended outside the property boundaries?

None

6. Who should we contact if any clarifications are required?

Name - Andrew Polahar

Address - 1101 Market St, BR4A, Chattanooga, TN 37402

Phone and Fax Number - 423-751-4811

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 100

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Oil Filling/Transporting Equipment - 100%

Above Ground Oil Storage Tanks - 100%

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Other (please describe) - Substations do not require secondary containment.

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit				
Fire Quenching & Oil Retention Pit				
Gravity Separator				
Oil-Water Separator	X	X	X	X
Oil Trap				
Oil Absorbing Polymer Beads				

Perimeter or Equipment Berm

Oil Detection-Triggered Sump Pump

Oil-Water Stop Valve

Other (please describe)

Comments: Tennessee Valley Authority

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -Tanks not part of survey

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - Used when justifying size of O/W Separator

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - NA

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - NA

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

Show this Page Only

15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector	X	X
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand		
Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck		
Soil Removal	X	

Other (please describe) _____
Comments: _____

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

158.106.48.10

Response Started:

Wednesday, May 2, 2012 3:34:42 AM

Response Modified:

Wednesday, May 2, 2012 3:37:38 AM

[Show this Page Only](#)

1. What is the name of your Company?

No Response

2. What is your Company's primary classification?

General Interest

3. How many sub/switching stations exist on your system?

No Response

4. At these stations, how many spill events have you had in the last 10 years?

No Response

5. Of these spills how many extended outside the property boundaries?

No Response

6. Who should we contact if any clarifications are required?

No Response

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

Browse Responses

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

205.132.74.4

Response Started:

Wednesday, May 2, 2012 4:36:34 AM

Response Modified:

Wednesday, May 2, 2012 4:46:48 AM

[Show this Page Only](#)

1. What is the name of your Company?

Allegheny Power

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

1700

4. At these stations, how many spill events have you had in the last 10 years?

73

5. Of these spills how many extended outside the property boundaries?

15

6. Who should we contact if any clarifications are required?

Name - Corey Giles

Address - 311 S 7th St. Connellsville, PA 15425

Phone and Fax Number - 724-626-5108

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

Browse Responses

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

74.5.204.40

Response Started:

Wednesday, May 2, 2012 5:29:33 AM

Response Modified:

Wednesday, May 2, 2012 5:32:38 AM

[Show this Page Only](#)

1. What is the name of your Company?

Wolf Creek Nuclear Operating Corp

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

1

4. At these stations, how many spill events have you had in the last 10 years?

0

5. Of these spills how many extended outside the property boundaries?

0

6. Who should we contact if any clarifications are required?

Name - Daniel Williamson

Address - WCNOG PO Box 411 Burlington, Ks 66839

Phone and Fax Number - (620) 364-8831 (620) 364-4154

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7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

Browse Responses

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

167.77.0.11

Response Started:

Wednesday, May 2, 2012 5:47:36 AM

Response Modified:

Wednesday, May 2, 2012 6:15:55 AM

[Show this Page Only](#)

1. What is the name of your Company?

Duquesne Light Company

2. What is your Company's primary classification?

No Response

3. How many sub/switching stations exist on your system?

~200

4. At these stations, how many spill events have you had in the last 10 years?

~10

5. Of these spills how many extended outside the property boundaries?

None

6. Who should we contact if any clarifications are required?

Name - John Bigi

Address - 2825 New Beaver Avenue, N6-E, Pittsburgh, PA 15233

Phone and Fax Number - 412-393-7905

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

Alternative Fluids - 0

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 98

Vandalism - 1

Human Error - 1

Other (Please explain in comments at end of survey) - 0

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - oil containment pits

Oil Circuit Breakers - oil containment pits

Shunt Reactors - slagged surface area

Oil-Filled Cables (Including Terminal Stations) - Full secondary containment for tanks, NA for pipeline

Three Phase Regulators - oil containment pits

Single Phase Regulators - oil containment pits

Mobile Transformers - NA

Mobile Breakers - NA

Mobile Regulators - NA

Mobile Substations - Use substation containment devices or lots with total secondary containment

Oil Filling/Transporting Equipment - Usually parked empty. When in use, substation surface area is sufficient. If parked full, then parked in lot with secondary containment.

Station Service Transformers - Generally small and use slagged surface area of substation. If inside, oil-stop is used in drains.

Potential Transformers - Generally small and use slagged surface area of substation.

Current Transformers - Generally small and use slagged surface area of substation

Current Transformers - Generally small and use slagged surface area of substation.

Capacitor Banks - Generally small and use slagged surface area of substation.

Above Ground Oil Storage Tanks - Secondarily contained with no exceptions

Below Ground Oil Storage Tanks - Double walled Fiberglass.

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - All Transformers, OCBs, Regulators require secondary containment in substations

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit				
Fire Quenching & Oil Retention Pit		X		
Gravity Separator				
Oil-Water Separator				
Oil Trap				X
Oil Absorbing Polymer Beads				X
Perimeter or Equipment Berm				X
Oil Detection-Triggered Sump Pump				X
Oil-Water Stop Valve				X
Other (please describe)				X
<i>Comments:</i> Duquesne Light Company				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -100-110%. Even though "General Secondary Containment" is warranted, we still size or oversize the pits.

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? -Generally 10% extra volume

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - Varies

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - 3 feet or more (varies)

Do you evaluate the soil characteristics to determine if the pit should be lined? - No

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - According to EPRI study we had conducted, oil must be 12 inches below slag surface to provide sufficient fire quenching. This is based on #2 Duquesne Slag.

Design void ratio for oil containment volume? - 40 % porosity factor is used for #2 Duquesne Slag.

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand	X	
Berm Cleanup	X	
Dike on Sloped Ground	X	
Stone Vacuum Truck	X	
Soil Removal	X	
Other (please describe)		

Comments:

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

[Edit Response](#)

[Delete](#)

Custom Value:

empty

IP Address:

161.156.101.6

Response Started:

Wednesday, May 2, 2012 5:31:35 AM

Response Modified:

Wednesday, May 2, 2012 6:36:17 AM

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1. What is the name of your Company?

SCANA Inc

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

500

4. At these stations, how many spill events have you had in the last 10 years?

39

5. Of these spills how many extended outside the property boundaries?

1

6. Who should we contact if any clarifications are required?

Name - Tim Nelson

Address - 220 Operations Way, Cayce, SC 29033

Phone and Fax Number - 803-217-7204

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 86

Vandalism - 3

Human Error - 8

Other (Please explain in comments at end of survey) - 3

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - in new subs and high risk subs

Oil Circuit Breakers - high risk subs

Single Phase Regulators - in new subs and high risk subs

Potential Transformers - in high risk subs

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - ranked 1-5 from <500 gals to > 10,000 gals

Proximity to navigable waters - ranked 1-5 from > 2,500 ft to < 100 ft

Location of substation (urban, rural, etc) - ranked 1-5 from rural to urban

Emergency response time if a spill occurs - ranked 1-5 from < 5 miles to > 40 miles

Other (please describe) - Rankings affected by presence or not of SCADA system and whether (in case of customers subs) or not personnel are onsite 24 hours /day

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit	X	X	X	X
Fire Quenching & Oil Retention Pit				
Gravity Separator				
Oil-Water Separator	X	X	X	X
Oil Trap	X	X		
Oil Absorbing Polymer Beads				
Perimeter or Equipment Berm			X	X
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)			X	X
<i>Comments: SCANA Inc</i>				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the selected percentage based on? -120 %

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - yes, 20 %

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - far enough to caintain any vertical leaks

Do you evaluate the soil characteristics to determine if the pit should be lined? - all pits are made of concrete

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner	X		X	X
Geomembrane Liner				
Spray-On Liner				
Clay (Bentonite)				
Concrete	X	X		X

Others (please specify)

Comments:

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - no

Show this Page Only

15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		
Cover with Sand		
Berm Cleanup		
Dike on Sloped Ground		
Stone Vacuum Truck	X	X
Soil Removal	X	X
Other (please describe)		

Comments:

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
(Web Link)

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Custom Value:

empty

IP Address:

161.186.93.10

Response Started:

Wednesday, May 2, 2012 5:53:54 AM

Response Modified:

Wednesday, May 2, 2012 7:57:14 AM

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1. What is the name of your Company?

Pepco

2. What is your Company's primary classification?

User

3. How many sub/switching stations exist on your system?

No Response

4. At these stations, how many spill events have you had in the last 10 years?

No Response

5. Of these spills how many extended outside the property boundaries?

No Response

6. Who should we contact if any clarifications are required?

No Response

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
Containment Survey
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Custom Value:

empty

IP Address:

157.225.178.103

Response Started:

Thursday, May 3, 2012 9:48:22 AM

Response Modified:

Thursday, May 3, 2012 9:50:15 AM

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1. What is the name of your Company?

New York State Electric & Gas Corporation

2. What is your Company's primary classification?

No Response

3. How many sub/switching stations exist on your system?

No Response

4. At these stations, how many spill events have you had in the last 10 years?

No Response

5. Of these spills how many extended outside the property boundaries?

No Response

6. Who should we contact if any clarifications are required?

No Response

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

No Response

8. Approximately what percent of the following sources are the cause of your spills?

No Response

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

No Response

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

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15. Which of the following oil spill cleanup methods do you employ?

No Response

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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Custom Value:

empty

IP Address:

204.124.192.32

Response Started:

Friday, May 4, 2012 8:53:14 AM

Response Modified:

Friday, May 4, 2012 12:10:54 PM

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1. What is the name of your Company?

MidAmerican Energy Company

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

386

4. At these stations, how many spill events have you had in the last 10 years?

<5

5. Of these spills how many extended outside the property boundaries?

None

6. Who should we contact if any clarifications are required?

Name - Robin Fortney

Address - 4299 NW Urbandale Drive, Urbandale, IA 50322

Phone and Fax Number - Phone: 515-281-2951 Fax: 515-242-3084

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 80

Vandalism - 10

Human Error - 10

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - pit, berm

Oil Circuit Breakers - trench/moat, berm

Shunt Reactors - pit, berm

Oil-Filled Cables (Including Terminal Stations) - double wall tank at terminal stations

Three Phase Regulators - pit, trench/moat

Single Phase Regulators - gravel bed

Mobile Transformers - berm, pit, gravel bed

Mobile Breakers - berm, pit, gravel bed

Mobile Regulators - berm, pit, gravel bed

Mobile Substations - berm, pit, gravel bed

Oil Filling/Transporting Equipment - berms, pop-up containment, drip pans, absorbent materials, tools for building berms

Station Service Transformers - gravel bed

Potential Transformers - trench/moat, gravel bed

Current Transformers - trench/moat, gravel bed

Oil Circuit Reclosers - gravel bed

Capacitor Banks - gravel bed

Above Ground Oil Storage Tanks - double wall

Below Ground Oil Storage Tanks - NA

Other (Please Describe) - Gravel bed used only if no drain or conduit to surface water. Use emergency generators with double walled fuel tank. Note: Constructed containment is provided for larger oil-filled equipment where there is a medium to high risk of off-site release (based on oil capacity and distance to surface water or drain). At low risk substations, gravel bed provides containment.

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10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

Volume of oil in individual device - 55 gallon>

Total volume of oil in substation - 1,320 gallon>

Proximity to navigable waters - <100 feet from drain or surface water

Location of substation (urban, rural, etc) - Proximity to residential or commercial customers

Failure probability of the equipment - Assume 100% failure

Laws and regulations - EPA regulations and guidance and company policy

11. Which of the following secondary oil spill containment methods have been used in your stations?

	New Installations	Effective	Retrofit Installations	Effective
Open Oil Retention Pit	X	X	X	X
Fire Quenching & Oil Retention Pit				
Gravity Separator				
Oil-Water Separator				
Oil Trap				
Oil Absorbing Polymer Beads			X	X
Perimeter or Equipment Berm			X	X
Oil Detection-Triggered Sump Pump				
Oil-Water Stop Valve				
Other (please describe)				
<i>Comments:</i> MidAmerican Energy Company				

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

What percent of the tank's oil volume is the pit designed to retain? What reason or criteria is the

selected percentage based on? -100% plus 25 year/24 hour maximum rain event (inches) per EPA guidance

Do you include rainwater and/or water from the fire protection systems in sizing of spill containments and if so how much? - See above, 6 inches of freeboard

For transformers, how far beyond the edge of the tank/radiators does the pit normally extend? - 3 feet minimum; may be greater

For oil filled breakers, how far beyond the edge of the tank does the pit normally extend? - 3 feet minimum; may be greater

Do you evaluate the soil characteristics to determine if the pit should be lined? - No

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

	Used	New Designs	Retrofit Designs	Effective
Rubber Liner				
Plastic Liner				
Geomembrane Liner	X	X	X	X
Spray-On Liner				
Clay (Bentonite)				
Concrete	X			X
Others (please specify)				

Comments:

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

Design depth below the rock/stone surface the level of oil will reach to ensure fire quenching will be successful? - N/A

Design void ratio for oil containment volume? - 40% is void volume.

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15. Which of the following oil spill cleanup methods do you employ?

	Used	Effective
River Boom Deflector		
Straw Skimming		
Expanded Straw Skimming		
Lake Boom Deflector		

Cover with Sand		
Berm Cleanup	X	X
Dike on Sloped Ground		
Stone Vacuum Truck	X	X
Soil Removal	X	X
Other (please describe)		
<i>Comments:</i>		

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Response Type:

Normal Response

Collector:

IEEE Substation Committee E2 Oil
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Custom Value:

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IP Address:

161.186.93.10

Response Started:

Friday, May 4, 2012 11:57:44 AM

Response Modified:

Friday, May 4, 2012 12:02:56 PM

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1. What is the name of your Company?

Pepco

2. What is your Company's primary classification?

Producer

3. How many sub/switching stations exist on your system?

about 140

4. At these stations, how many spill events have you had in the last 10 years?

Estimate 25 to 30

5. Of these spills how many extended outside the property boundaries?

None that I can recall

6. Who should we contact if any clarifications are required?

Name - Colin Danville

Address - 701 Ninth Street NW Washington DC

Phone and Fax Number - (202) 331-6467

Show this Page Only

7. Of your fluid filled equipment approximately what percentage of equipment is filled with the following?

Mineral Oil - 100

8. Approximately what percent of the following sources are the cause of your spills?

Equipment Failure - 95

Human Error - 5

9. For which of the following devices do you provide secondary oil containment and/or diversionary structures to prevent discharged oil from exiting the station (e.g., berms, oil containment pits, drainage through oil/water separators, etc)? Also, please indicate the typical breakpoint in voltage, MVA, etc, (examples: For transformers - 10 MVA and above, for Breakers - 138 kV and above) for that type of equipment where your company deems the quantity of oil in the device high enough to warrant secondary containment. If not used, this question is not applicable. Note: secondary oil containment = a system designed to contain the oil discharged from an oil-filled piece of equipment in situations of primary oil-containment failure.

Power Transformers - Secondary containment

Shunt Reactors - Secondary containment

Mobile Transformers - Secondary containment

Mobile Substations - Secondary containment

Oil Filling/Transporting Equipment - bermed truck unloading area

Above Ground Oil Storage Tanks - Secondary containment

Below Ground Oil Storage Tanks - Leak detection

Show this Page Only

10. Which of the following criteria determines whether secondary containment is required at your substations. Please describe the criteria numerically in the third column (e.g., >1000 gals, ≤ 500 ft from water, etc.)

No Response

11. Which of the following secondary oil spill containment methods have been used in your stations?

No Response

12. If oil retention pits under large equipment such as transformers and oil filled circuit breakers are used:

No Response

13. Where an impervious material is used to line the pit, what material is used? New Liner Materials:

No Response

14. Do you fill containment pits with crushed rock or stone for fire suppression? If yes, what values are typically used for the following:

No Response

Show this Page Only

15. Which of the following oil spill cleanup methods do you employ?

No Response
