DIVISION OF RATEPAYER ADVOCATES
A.13-02-023 Energy Resource Recovery Acct 2012-Compliance
DRA Response to PG&E DR #3 (3rd Partial Response)

Recipient	Division of Ratepayer Advocates		
PG&E Data Request No.:	PGE_DRA-003		
PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q8a		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8a:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

a. Please explain how performing daily routine inspections of the engine and engine components would have enabled PG&E to discover the damage to the turbocharger turbine.

DRA Response

a. Please explain how performing daily routine inspections of the engine and engine components would have enabled PG&E to discover the damage to the turbocharger turbine.

The damage that occurred to the inner liners in the exhaust manifold (which has been acknowledged by PG&E) should have given rise to certain indicators that would have enabled PG&E to discover this damage before any, or the full extent of, further damage was sustained to the turbocharger turbine. Based on daily inspections by PG&E staff, qualified to operate and maintain the facility, early warning signs of damage to the engine or engine components could have been noticeable to the human senses, particularly by individuals trained in identifying damage to the facility, thereby allowing PG&E to undertake prompt remedial action. For instance, inspectors may have detected audible differences in sound level and type, compared to normal operations, resulting from movements of broken metal fragments originating from the gradual cracking of the inner liner of the exhaust manifold, damage to the turbine blades, or unusual vibrations from engine components arising out of this damage.

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PG&E Data Request No.:	PGE_DRA-003		
PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q8b		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8b:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

b. Please explain DRA's understanding of whether daily routine inspections of the engine and engine components involve the disassembly of any equipment.

DRA Response

b. Please explain DRA's understanding of whether daily routine inspections of the engine and engine components involve the disassembly of any equipment.

As indicated in DRA's Testimony, according to the maintenance schedule that Wartsila, the supplier of the component, provided to PG&E and that is recommended for the engines and engine components at this resource, PG&E should have conducted daily routine inspections of the engine and associated components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours. DRA asserts that daily routine inspections should have been conducted in accordance with the maintenance schedule recommended by the manufacturer of the component, and those daily routine inspections of the engine and engine components should involve the disassembly of the equipment to the extent that the manufacturer recommends it. However, DRA is not aware of the extent to which Wartsila recommends that daily routine inspections of the engine and engine components involve the disassembly of any equipment because such facts have not been provided to DRA for its review.

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PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q8c		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8c:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

c. Please explain how water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, would have enabled PG&E to discover the damage to the turbocharger turbine.

DRA Response

c. Please explain how water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, would have enabled PG&E to discover the damage to the turbocharger turbine.

DRA's testimony includes an evaluation of whether PG&E followed the maintenance schedule recommended by the manufacturer. PG&E's response to DRA's DR 17, question 10, indicates that PG&E did not comply with this schedule. The water cleaning of the compressor in the turbocharger, as well as being a part of the recommended maintenance schedule, also represented an opportunity to identify if there was any damage (or results of damage) that could be detected within the turbocharger components of each unit. For instance, fragments of the cracked inner liner may have been visible during the cleaning process or noticeable in the effluent resulting from this cleaning process. Also, fragments of the cracked inner liner present in or around the compressor may have caused a specific set of sounds during the cleaning process that would have highlighted that some damage had occurred to the equipment.

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PG&E Data Request No.:	PGE_DRA-003		
PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q8d		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8d:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

d. Please explain DRA's knowledge of how water cleaning of the compressor in the turbocharger is accomplished.

DRA Response

d. Please explain DRA's knowledge of how water cleaning of the compressor in the turbocharger is accomplished.

Water cleaning of the compressor in the turbocharger should be conducted according to the manufacturer's specifications. However, DRA does not have knowledge of the specific procedures that Wartsila recommends to conduct the water cleaning of the compressor and as PG&E did not follow the recommendation to clean the compressor such facts were not provided to DRA for its review.

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Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8e:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

e. Please explain how water cleaning of the turbine in the turbocharger every 100 hours would have enabled PG&E to discover the damage to the turbocharger turbine.

DRA Response

e. Please explain how water cleaning of the turbine in the turbocharger every 100 hours would have enabled PG&E to discover the damage to the turbocharger turbine.

As described in c. above, DRA's testimony includes an evaluation of whether PG&E followed the maintenance schedule recommended by the manufacturer. PG&E's response to DRA's DR 17, question 10, indicates that PG&E did not comply with this schedule. The water cleaning of the turbine in the turbocharger every 100 hours, as well as being a part of the recommended maintenance schedule, also represented an opportunity to identify if there was any damage (or results of damage) that could be detected within the turbocharger components of each unit. For instance, fragments of the cracked inner liner may have been visible during the cleaning process or noticeable in the effluent resulting from this cleaning process. Also, fragments of the cracked inner liner present in or around the compressor may have caused a specific set of sounds during the cleaning process that would have highlighted that some damage had occurred to the equipment.

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PG&E Data Request No.:	PGE_DRA-003		
PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q8f		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.8f:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.8. On page 3-10, DRA concludes that PG&E failed to show that it prudently conducted maintenance activities on HBGS Unit 5. DRA states that if PG&E would have conducted daily routine inspections of the engine and engine components, as well as water cleaning of the compressor in the turbocharger, at intervals of every 50 operating hours, and water cleaning of the turbine in the turbocharger every 100 hours, then PG&E should have discovered the damage to the turbocharger turbine prior to the maintenance outages scheduled in response to the unrelated service bulletin from ABB.

f. Please explain DRA's knowledge of how water cleaning of the turbine in the turbocharger is accomplished.

DRA Response

f. Please explain DRA's knowledge of how water cleaning of the turbine in the turbocharger is accomplished.

Water cleaning of the turbine should be conducted according to the manufacturer's specifications. However, DRA does not have knowledge of the specific procedures that Wartsila recommends to conduct the water cleaning of the turbine in the turbocharger, and as PG&E did not follow the recommendation to clean the turbine such facts were not provided to DRA for its review.

.Recipient	Division of Ratepayer Advocates		
PG&E Data Request No.:	PGE_DRA-003		
PG&E File Name:	EnerResourceRecoveryAcct2012-Compliance_DR_PGE_DRA-003/Q9		
Request Date:	September 9, 2013	PG&E Witness:	Redacted
Due Date:	September 16, 2013	DRA Witness:	Ravinder Mangat

Questions 3.9:
Chapter 3 -- PG&E's Management of Utility-Owned Generation – Fossil (Ravinder Mangat)

3.9. On page 3-11, lines 5-8, DRA claims that PG&E failed to notice a difference in the operation of the engines during routine external monitoring of the engine components.
a. What type of difference in the operation of the engines should PG&E have noticed during routine external monitoring of the engine components?
b. Please describe DRA's understanding of the sound level (in dB) in the HBGS engine room during the normal operation of an engine.

DRA Response

a. What type of difference in the operation of the engines should PG&E have noticed during routine external monitoring of the engine components?

The damage that occurred to the inner liners in the exhaust manifold (which has been acknowledged by PG&E) should have given rise to certain indicators that would have enabled PG&E to discover this damage before any, or the full extent of, further damage was sustained to the turbocharger turbine. Based on routine external monitoring of the engine components, PG&E could have identified that there was damage to the engine or engine components, thereby allowing PG&E to undertake prompt remedial action. For instance, PG&E could have recorded a reduction in their output performance or identified differences in the operation of the facility that were noticeable by the human senses (of PG&E employees trained in the operation and maintenance of the facility).

b. Please describe DRA's understanding of the sound level (in dB) in the HBGS engine room during the normal operation of an engine.

DRA cannot speculate about the sound level (in dB) in the HBGS engine room during the normal operation of an engine because this fact has not been provided to DRA for its consideration. However, DRA acknowledges that it is a very loud environment.