

**TALWANDI SABO POWER LIMITED, BANAWALA**

**Compliance report of the conditions stipulated in Environmental Clearance for 1980 MW (3X660 MW) Talwandi Sabo Power Limited and additional conditions stipulated in Office Memorandum No. J-11013/41/2006-IA.II (I) dt. 06/04/2011, for the period of April, 2017 to September, 2017.**

<b>3</b>	<b>Conditions</b>	<b>Compliance Status</b>
(i)	The total land requirement for the project shall be restricted to 2105 acres	Complied
(ii)	Requisite quantity of coal for the ultimate capacity shall be obtained before commissioning the project	Complied
(iii)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.5% and 34% respectively	Noted.
(iv)	<b>(As amended vide MoEF letter No. J-13011/24/2008-IA. II (T) dt. 17/06/2010)</b> A Tri-flu stack of 275 m height shall be provided with continuous online monitoring equipments for SO <sub>x</sub> , NO <sub>x</sub> and particulate. Exit velocity of the flue gases shall not be less than 25m/sec	Complied. Exit velocity of flue gases has taken care in design and condition noted.
(v)	High efficiency Electrostatic Precipitator (ESP) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm <sup>3</sup>	Complied. Stack emission monitoring reports for the period of June-2017 to September-2017 are enclosed as <b>Annexure-1</b> .
(vi)	Space provision shall be kept for retrofitting of FGD, If required at a later date	Complied.
(vii)	Adequate dust extraction system such as cyclone/bag filters and water spray system in dusty areas such as coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided	Complied.
(viii)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Fly ash shall be used in a phased manner as per provision of the notification on Fly Ash Utilization issued by Ministry in September 1999 and its amendment. By the end of 9 <sup>th</sup> year full fly ash utilization should be ensured. Unutilized fly ash shall be disposed off in the ash pond in the form of High Concentration slurry and the bottom ash in conventional slurry mode.	Complied. Fly ash is being used in phased manner as stipulated. Fly ash report is being submitted to CPCB and MoEF&CC, Chandigarh annually and to PPCB on monthly basis.
(ix)	Ash pond shall be lined with HDPE lining. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached	Complied.

*T. G. G. G.*

**TALWANDI SABO POWER LIMITED, BANAWALA**

(x)	Closed cycle cooling system with cooling towers shall be provided. COC of at least 5 shall be adopted and the effluents shall be treated as per the prescribed norms	Complied. COC of 5 has been maintained and the cooling tower blow down is being treated in Zero Discharge Unit as per the prescribed norms and recycled for cooling tower make-up.
(xi)	The treated effluent conforming to the prescribed standards shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary except during monsoon. Arrangement shall be made that effluents and storm water do not get mixed.	Complied.
(xii)	A sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt/plantation	Complied.
(xiii)	Rain water harvesting should be adopted. Central Ground Water Authority/Board shall be consulted for finalization of appropriate rain water harvesting technology within a period of three months from the date of clearance and details shall be furnished.	Complied.
(xiv)	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fire in coal yard especially during summer season. Copy of these measures with full details along with location plant lay out shall be submitted to the ministry as well to the regional office of the ministry at Chandigarh.	Complied.
(xv)	Storage facilities for liquid fuel such as LDO and HFO/LSHS shall be made in the plant area where risk in minimum to the storage facilities. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place. Mock drills shall be conducted regularly and based on the same, modifications required, if any shall be incorporated in DMP.	Complied. Mock drills are being conducted regularly.
(xvi)	Regular monitoring of ground water in and around ash pond area shall be carried out, records maintained and six monthly reports shall be furnished to the Regional office of this Ministry	Complied. Ground water monitoring reports are enclosed as <b>Annexure-2</b> .
( xvii)	A green belt of adequate width and density shall be developed around the plant periphery covering about 1/3 of the project area preferably with local species	Complied.

*T. Talwar*

**TALWANDI SABO POWER LIMITED, BANAWALA**

(xviii)	Activities under CSR shall be enhanced with proper financial allocation. Details of these activities shall be submitted to the Regional office of the Ministry, SPCB and the Ministry	Complied. CSR activities done for the period of April-2017 to September-2017 is enclosed as <b>Annexure-3</b> .
(xix)	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase	Complied.
(xx)	Leq of Noise levels emanating from turbines shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplug/ ear muff etc shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.	All turbines have been provided with acoustic enclosure and installed inside enclosed building.
(xxi)	Regular monitoring of ground level concentration of SO <sub>2</sub> , NO <sub>x</sub> , SPM, RSPM shall be carried out in the impact zone and record maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring station and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the regional office of this ministry.	Complied. Ambient Air Quality monitoring reports for the period of April-2017 to September-2017 are enclosed as <b>Annexure-4</b> .
(xxi)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locally concerned within seven days from the date of this clearance letter, informing that the project has been accorded environment clearance and copies of clearance letter are available with State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a>	Complied.
(xxii)	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards	Complied.
(xxiii)	Half yearly report on the status of	Complied and continue the same

*T. G. G. G.*

**TALWANDI SABO POWER LIMITED, BANAWALA**

	implementation of the stipulated condition and environmental safeguards shall be submitted to this Ministry/Regional Office/CPCB/SPCB	
(xxiv)	Regional office of the Ministry of Environment & Forest located at Chandigarh will monitor the implementation of the stipulated conditions. A complete set of documents including Environment Impact Assessment report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring	Complied.
(xxv)	Separate funds shall be allocated for implementation of environment protection measures along with item-wise break up. These cost shall be included as part of the project cost. The fund earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	Complied and continue the same.
(xxvi)	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and date of land development work and commissioning of plant	Complied.
(xxvii)	Full cooperation shall be extended to the Scientist / Officers from the Ministry/Regional Office of the Ministry at Chandigarh/ the CPCB/the SPCB who would be monitoring the compliance of environmental status	Noted.
<b>Additional Conditions vide Office Order No J-13011/24/2008-IA.II(T) dated 25/03/2010</b>		<b>Compliance Status</b>
(xxviii)	The project proponent shall upload the status of compliance of the conditions stipulated in environment clearance issued vide this Ministry's letter of even no dated 11.07.2008, in its website and updated periodically and also simultaneously send the same by e-mail to the Regional Office of the Ministry of Environment and Forests	Complied and continue the same.

*T. P. Jain*

**TALWANDI SABO POWER LIMITED, BANAWALA**

(xxix)	Criteria pollutants levels including NOx, RSPM (PM <sub>10</sub> & PM <sub>2.5</sub> ), Sox (from Stack & ambient air) shall be regularly monitored and results displayed in your website and also at the main gate of the power plant	Complied and continue the same.
<b>Additional Conditions vide letter No J-13011/24/2008-IA.II(T) dated 30/09/2013</b>		<b>Compliance Status</b>
(xxx)	Scheme for harnessing solar power within the premises of the plant (particularly at available roof tops) shall be critically examined and status of implementation shall be submitted.	Complied. Installed 30 KWp solar photovoltaic power plant.
(xxxi)	Waste Water generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB/CPCB and no effluent, under any circumstances whatsoever, should be discharged into low lying area or into estuary.	Complied. Plant has been designed based on zero discharge concept and no wastewater is being discharged outside the plant boundary.
(xxxii)	A long term study on radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Bhabha Atomic Research Centre (BARC) and MoEF &CC/PPCB/NABL approved lab have been engaged for testing radio activity and heavy metals in coal, fly ash including bottom ash.
(xxxiii)	It shall be ensured that in-built monitoring mechanism for the CSR schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	In built monitoring mechanism for CSR schemes already in place. Social Audit study was conducted by JMI University, New Delhi in February 2016 for CSR initiatives implemented for the period of 2012-2015.
(xxxiv)	The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	Complied.
4	The Ministry of Environment and Forest reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry, MOEF may impose additional environmental conditions or modify the existing ones, if necessary.	Noted

*J. A. S.*

**TALWANDI SABO POWER LIMITED, BANAWALA**

5	The environmental clearance accorded shall be valid for a period of 5 years to start of production operations by the power plant.	Noted. All units i.e. 3x660 MW are operational
6	In case any deviation or alteration in the project proposed from those submitted to this Ministry for clearance a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required if any	Noted
7	The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling) Rules 1989 and its amendments, The Public Liability Insurance Act, 1991 and its amendments	Noted
8	Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred, within 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997	Noted
<b>Additional Conditions (as per MoEF Office Memorandum No.J.11013/41/2006-IA.II (I) dated 06/04/2011)</b>		<b>Compliance Status</b>
(i)	Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.	Continuous Ambient Air Quality Monitoring (CAAQM) Stations and Continuous Emission Monitoring System (CEMS) have been provided for monitoring of ambient air quality and stack emissions and records are being maintained accordingly.

*T. A. S.*

**TALWANDI SABO POWER LIMITED, BANAWALA**

(ii)	The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective State Pollution Control Board/UTPCCs and the Regional Office of MoEF.	Complied and continue the same.
(iii)	The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.	Complied and continue the same.
<b>MoEF&amp;CC Office Memorandum No.L-11011/17/2014-IA.I (T) dated 25/09/2014)</b>		<b>Compliance Status</b>
(i)	The Thermal Power Plants attracting the said Notification shall submit its compliance to the Ministry's Regional Office and SPCB concerned along with the compliance reports of the environmental safeguards stipulated in the ECs and Consents	Complied and continue the same.

*T. G. Das*



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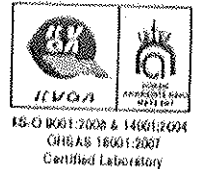
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## TEST REPORT

Document QF: 2501

Reg. No: R-30-06-1

ISSUED TO: M/s Talwandi Sabo Power Limited  
Village: Banawala, Mansa Talwandi Sabo Road,  
Mansa (Punjab)

Report No. : W-30U85717

Dated : 03.07.2017

Party Ref Po No : G600006379

Dated : 11.07.2016

Description of Sample: One sample of stack emission was collected by lab rep. on 26.06.2017

### SAMPLE PARTICULARS

General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : First Unit (Unit-II)
3. Type of Stack / Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 40
7. Purpose of Monitoring : For Self Monitoring
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

Observations:

1. Flue Gas Temperature, °C, Avg. : 140
2. Ambient Air Temperature, °C : 41

### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	45
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	908
3	Oxide of Nitrogen (NO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	378
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	ND (0.1)

ND-Not Detectable, figure shown in bracket indicate method detection limit

Remark: During monitoring CO<sub>2</sub> was found to be 8.6% v/v.

\*As per Client's Statutory Requirement

DOS: 30.06.2017

DCC: 03.07.2017

- End of Report -

This analysis report is not valid  
for other purposes of the Govt

Pradeep Kumar

Tech. Manager (Env.)

- NOTE:
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## TEST REPORT

Document QF: 2501

Reg. No: R-30-06-4

ISSUED TO: M/s Talwandi Sabo Power Limited Village: Banawala, Mansa Talwandi Sabo Road, Mansa (Punjab)	Report No. : W-30U85817 Dated : 03.07.2017 Party Ref Po No : 6600006379 Dated : 11.07.2016
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Description of Sample: One sample of stack emission was collected by lab rep. on 26.06.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

- Name of the emission source monitored : Stack Emission of Boiler
  - Rated Capacity : 660 MW
  - Capacity on sampling day : 660 MW
  - Type of fuel used & its consumption : Coal
  - Normal operating schedule : 24 Hrs
- Stack Identification : Second Unit (Unit-III)
- Type of Stack / Duct : Metal
- Stack Height from ground level (m) : 275
- Diameter of the Stack (cm) : 720
- Sampling Duration (minutes) : 37
- Purpose of Monitoring : For Self Monitoring
- Air Pollution control measure : Hybrid ESP
  - Status : Working
  - Recovery of material : Fly Ash
- Fugitive Emission, if any : Nil

#### Observations:

- Flue Gas Temperature, °C, Avg. : 142
- Ambient Air Temperature, °C : 41

#### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	46
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	836
3	Oxide of Nitrogen (NO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	341
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	ND (0.1)

ND-Not Detectable. figure shown in bracket indicate method detection limit

Remark: During monitoring CO<sub>2</sub> was found to be 8.6% v/v

\*As per Client's Statutory Requirement

DOS: 30.06.2017

DOC: 03.07.2017

- End of Report -



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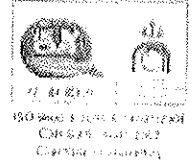
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## TEST REPORT

Document Q/F: 2501

Rev. No.: 3-01-11

ISSUED TO: M/s Talwandi Sabo Power Limited  
Village: Banawala, Mansa Talwandi Sabo Road,  
Mansa-151302 (Punjab)

Report No. W-18Y31317  
Dated 20.07.2017  
Party Ref Po No 666006379  
Dated 11.07.2016

Description of Sample: One sample of stack emission was collected by lab rep. on 14.07.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : First Unit (Unit-II)
3. Type of Stack : Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 34
7. Purpose of Monitoring : For Self Monitoring
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

#### Observations:

1. Flue Gas Temperature, °C, Avg : 141
2. Ambient Air Temperature, °C : 42

#### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max	48
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air		952
3	Oxide of Nitrogen (NO <sub>x</sub> ), mg/Nm <sup>3</sup>	APHA Air		351
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air		ND (0.1)

ND: Not Detectable, figure shown in bracket indicate method detection limit

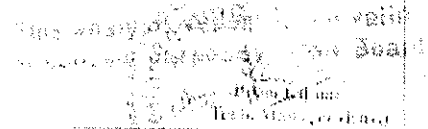
Remark: During monitoring CO<sub>2</sub> was found to be 8.6% v/v.

\* As per Client's Statutory Requirement

18/07/2017

18/07/2017

- End of Report -



NOTE: 1. The results listed refer only to tested sample and applicable parameters.

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## TEST REPORT

Document QF: 2501

Reg. No: R-18-07-11

ISSUED TO: M/s Talwandi Sabo Power Limited Village: Banawala, Mansa Talwandi Sabo Road, Mansa-151302 (Punjab)	Report No. : W-18Y31417 Dated : 20.07.2017 Party Ref Po No : 6600006379 Dated : 11.07.2016
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**Description of Sample:** One sample of stack emission was collected by lab rep. on 14.07.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : Second Unit (Unit-III)
3. Type of Stack / Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 34
7. Purpose of Monitoring : **For Self Monitoring**
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

#### Observations:

1. Flue Gas Temperature, °C, Avg. : 149
2. Ambient Air Temperature, °C : 42

#### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	47
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	916
3	Oxide of Nitrogen (NO <sub>x</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	282
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	

ND-Not Detectable, figure shown in bracket indicate method detection limit

Remark: During monitoring CO<sub>2</sub> was found to be 8.4% v/v

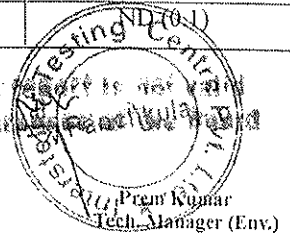
\*As per Client's Statutory Requirement

DOS: 18.07.2017

DOC: 20.07.2017

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## TEST REPORT

Document QF: 2501

Reg. No: K-02-09-6

ISSUED TO: M/s Talwandi Sabo Power Limited Village: Banawala, Mansa Talwandi Sabo Road, Mansa (Punjab)	Report No. : W-02S5717 Dated : 09.09.2017 Party Ref Po No : 6600006379 Dated : 11.07.2016
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Description of Sample: One sample of stack emission was collected by lab rep. on 30.08.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : First Unit (Unit-II)
3. Type of Stack / Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 36
7. Purpose of Monitoring : For Self Monitoring
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

#### Observations:

1. Flue Gas Temperature, °C, Avg. : 124
2. Ambient Air Temperature, °C : 35

### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	48
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	1215
3	Oxide of Nitrogen (NO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	362
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	ND (0.1)

ND-Not Detectable, figure shown in bracket indicate method detection limit

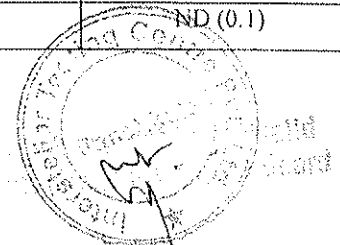
Remark: During monitoring CO<sub>2</sub> was found to be 11.2 % v/v.

\*As per Client's Statutory Requirement

DOS: 02.09.2017

DOC: 09.09.2017

- End of Report -



Prem Kumar  
Tech. Manager (Env.)

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## TEST REPORT

Document QI: 3501

Reg. No: R-02-09-6

ISSUED TO: M/s Talwandi Sabo Power Limited

Village: Banawala, Mansa Talwandi Sabo Road,  
Mansa (Punjab)

Report No. : W-02S5817

Dated : 09.09.2017

Party Ref Po No : 6600006379

Dated : 11.07.2016

Description of Sample: One sample of stack emission was collected by lab rep. on 30.08.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : Second Unit (Unit-III)
3. Type of Stack / Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 35
7. Purpose of Monitoring : For Self Monitoring
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

#### Observations:

1. Flue Gas Temperature, °C, Avg. : 132
2. Ambient Air Temperature, °C : 35

#### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	47
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	1182
3	Oxide of Nitrogen (NO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	432
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	ND (0.1)

ND-Not Detectable, figure shown in bracket indicate method detection limit

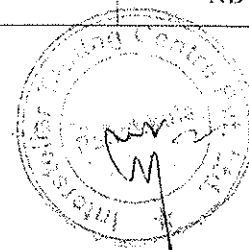
Remark: During monitoring CO<sub>2</sub> was found to be 11.6 % v/v.

\*As per Client's Statutory Requirement

DOS-02.09.2017

DOC-09.09.2017

- End of Report -



Prem Kumar  
Tech. Manager (Env.)

NOTE: 1. The results listed refer only to tested sample and applicable parameters.

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3. The samples will be destroyed after fifteen days from the date of issue of test certificate unless otherwise agreed with the customer.



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## TEST REPORT

Document QI: 2501

Reg. No: R-02-09-6

ISSUED TO: M/s Talwandi Sabo Power Limited  
Village: Banawala, Mansa Talwandi Sabo Road,  
Mansa (Punjab)

Report No. : W-02S5617  
Dated : 09.09.2017  
Party Ref Po No : 6600006379  
Dated : 11.07.2016

Description of Sample: One sample of stack emission was collected by lab rep. on 30.08.2017

### SAMPLE PARTICULARS

#### General Information (Supplied by Party)

1. Name of the emission source monitored : Stack Emission of Boiler
  - a. Rated Capacity : 660 MW
  - b. Capacity on sampling day : 660 MW
  - c. Type of fuel used & its consumption : Coal
  - d. Normal operating schedule : 24 Hrs
2. Stack Identification : Third Unit (Unit-I)
3. Type of Stack / Duct : Metal
4. Stack Height from ground level (m) : 275
5. Diameter of the Stack (cm) : 720
6. Sampling Duration (minutes) : 39
7. Purpose of Monitoring : For Self Monitoring
8. Air Pollution control measure : Hybrid ESP
  - a. Status : Working
  - b. Recovery of material : Fly Ash
9. Fugitive Emission, if any : Nil

#### Observations:

1. Flue Gas Temperature, °C, Avg. : 127
2. Ambient Air Temperature, °C : 34

#### Test Results

S. No.	Parameters	Method	*Standards	Result
1	Particulate Matter, mg/Nm <sup>3</sup> (Corrected at 12% CO <sub>2</sub> )	IS: 11255	50 Max.	47.9
2	Sulphur dioxide (SO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	1060
3	Oxide of Nitrogen (NO <sub>2</sub> ), mg/Nm <sup>3</sup>	APHA Air	--	344
4	Mercury as Hg, mg/Nm <sup>3</sup>	APHA Air	--	ND (0.1)

ND-Not Detectable, figure shown in bracket indicate method detection limit

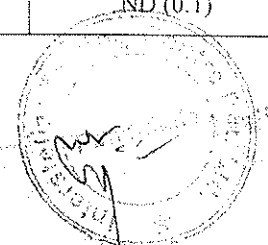
Remark: During monitoring CO<sub>2</sub> was found to be 11.4 % v/v.

\*As per Client's Statutory Requirement

DOS: 02.09.2017

DOC: 09.09.2017

- End of Report -



Prem Kumar  
Tech. Manager (Env.)

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## TEST REPORT

Ref. No. IL/D- 5828	Date 25.9.17	Lab No. 250917ED-NL-027	Page No. 1/1
Customer	M/s Talwandi Sabo Power Limited Village Banawala, Mansa- Talwandi Sabo Road Distt. Mansa Punjab		
Type of Sample	STACK MONITORING (BOILER)		
Customer's Description of Sample	STACK MONITORING (BOILER)		
Quantity	1 No		
Packing, Markings	Thimble Packed in Polythene Pouch		
Mode of Collection of Sample	Sampling by Laboratories		
Work Order No.	6600009047	Dated	21/09/2017
Date of Receipt of Sample	25/09/2017		
Period of Analysis	25/09/2017 To 29/09/2017		
Sampling Team Idma	Mr. Siya Ram & Team	Client	Mr. Nrusimha Tharra
Sampling Location	First Unit (Unit-2,660MW)		
Visual Observation	N/A		
Date of Sampling	22/09/2017		
Date of Reporting	29/09/2017		
Sampling Protocol	IS: 11255		
Testing Protocol	IS 11255 & EPA		

## RESULTS

S.No.	Test Parameter	Units	Results	Standards (MAX)	Test Method
1	Stack Height	meter	275	-	-
2	Stack Dia	meter	7.2	-	-
3	Control Device APCD	-	Hybride ESP	-	-
4	Ambient Temperature	° C	34	-	IS 11255 (P-3) 2003
5	Temperature of Stack Gases	° C	136	-	IS 11255 (P-3) 2003
6	Particulate Matter (PM)	mg/Nm <sup>3</sup>	47.5	Max 50	IS 11255 (P-1) 1985
7	Sulphur Dioxide (SO <sub>2</sub> )	mg/Nm <sup>3</sup>	1205	-	IS 11255 (P-2) 2003
8	Oxide of Nitrogen (NO <sub>x</sub> )	mg/Nm <sup>3</sup>	342	-	IS 11255 (P-7) 2005
9	Mercury (Hg)	mg/Nm <sup>3</sup>	ND [ MDL 0.001 ]	-	EPA:M-29/102

Opinion : ND :-Not Detected & MDL :- Method Delection Level.

\*\*End of Report\*\*

For Idma Laboratories Limited

Authorized Signatory

Idma Corporate Park, 391, Industrial Area, Phase-I, Panchkula, Haryana.  
Tel. No. : 0172-2577391, 5064827, 5064830, Fax No. : 91-172-2583587  
Website : www.idmagroup.co.in E-mail : testing@idmagroup.co.in

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## TEST REPORT

Ref. No. IL/D-5827	Date 25/09/17	Lab No. 250917ED-NL-026	Page No. 1/1
Customer	M/s Talwandi Sabo Power Limited Village Banawala, Mansa- Talwandi Sabo Road Distt. Mansa Punjab		
Type of Sample	STACK MONITORING (BOILER)		
Customer's Description of Sample	STACK MONITORING (BOILER)		
Quantity	1 No		
Packing, Markings	Thimble Packed in Polythene Pouch		
Mode of Collection of Sample	Sampling by Laboratories		
Work Order No.	6600009047	Dated	21/09/2017
Date of Receipt of Sample	25/09/2017		
Period of Analysis	25/09/2017 To 27/09/2017		
Sampling Team Idma	Mr. Siya Ram & Team	Client	Mr. Nrusimha Tharri
Sampling Location	Second Unit (Unit-3,660MW)		
Visual Observation	N/A		
Date of Sampling	22/09/2017		
Date of Reporting	27/09/2017		
Sampling Protocol	IS: 11255		
Testing Protocol	IS 11255 & EPA		

## RESULTS

S.No.	Test Parameter	Units	Results	Standards (MAX)	Test Method
1	Stack Height	meter	275	-	-
2	Stack Dia	meter	7.2	-	-
3	Control Device APCD	-	Hybride ESP	-	-
4	Ambient Temperature	° C	34	-	IS 11255 (P-3) 2003
5	Temperature of Stack Gases	° C	133	-	IS 11255 (P-3) 2003
6	Particulate Matter (PM)	mg/Nm <sup>3</sup>	38.6	Max 50	IS 11255 (P-1) 1985
7	Sulphur Dioxide (SO <sub>2</sub> )	mg/Nm <sup>3</sup>	1364	-	IS 11255 (P-2) 2003
8	Oxide of Nitrogen (NO <sub>x</sub> )	mg/Nm <sup>3</sup>	410	-	IS 11255 (P-7) 2005
9	Mercury (Hg)	mg/Nm <sup>3</sup>	ND[MDL 0.001]	-	EPA:M-29/102

Opinion : ND :-Not Detected & MDL :- Method Detection Level.

\*\*End of Report\*\*

For Idma Laboratories Limited

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## TEST REPORT

Ref. No. IL/D- 5835	Date 25/09/17	Lab No. 250917ED-NL-075	Page No. 1/1
Customer	M/s Talwandi Sabo Power Limited Village Banawala, Mansa- Talwandi Sabo Road Distt. Mansa Punjab		
Type of Sample	Stack Emissions (Boiler)		
Customer's Description of Sample	Stack Emissions (Boiler)		
Quantity	1 No.		
Packing, Markings	Thimble Packed in Polythene Bag		
Mode of Collection of Sample	Sampling By Laboratories		
Work Order No.	6600009047	Dated	21/09/2017
Date of Receipt of Sample	25/09/2017		
Period of Analysis	25/09/2017 To 26/09/2017		
Sampling Team Idma	Mr. Siya Ram & Team	Client	Mr. Nrusimha Tharra
Sampling Location	Third Unit (Unit-1,660 MW)		
Visual Observation	N/A		
Date of Sampling	24/09/2017		
Date of Reporting	26/09/2017		
Sampling Protocol	IS: 11255		
Testing Protocol	IS 11255 & EPA		

## RESULTS

S.No.	Test Parameter	Units	Results	Standards (MAX)	Test Method
1	Stack Height	meter	275	-	-
2	Stack Dia	meter	7.2	-	-
3	Control Device APCD	-	Hybride ESP	-	-
4	Ambient Temperature	° C	35	-	IS 11255 (P-3) 2003
5	Temperature of Stack Gases	° C	130	-	IS 11255 (P-3) 2003
6	Particulate Matter (PM)	mg/Nm <sup>3</sup>	47	Max 50	IS 11255 (P-1) 1985
7	Sulphur Dioxide (SO <sub>2</sub> )	mg/Nm <sup>3</sup>	1118	-	IS 11255 (P-2) 2003
8	Oxide of Nitrogen (NO <sub>x</sub> )	mg/Nm <sup>3</sup>	311	-	IS 11255 (P-7) 2005
9	Mercury (Hg)	mg/Nm <sup>3</sup>	ND[ MDL 0.001 ]	-	EPA/M-29/102

Opinion : ND :- Not Detected & MDL :- Method Detection Level.

\*\*End of Report\*\*

For Idma Laboratories Limited

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## TEST REPORT

Document QF: 2501

Reg. No: R-28-04-12

ISSUED TO: M/s Talwandi Sabo Power Limited  
Village: Banawala, Mansa Talwandi Sabo Road,  
Mansa (Punjab)

Report No. : W-28A58017

Dated : 03.05.2017

Party Ref Po No : 6600006379

Dated : 11.07.2016

Description of Sample: Ambient air quality monitoring

### SAMPLE PARTICULARS

1. Location of Sampling Point : Railway Building
2. Date of monitoring : 25.04.2017
3. Purpose of Monitoring : For Self Monitoring
4. Duration of Monitoring, minutes : 1440
5. Avg. Flow Rate of Sampling, m<sup>3</sup>/min : 0.037
6. Volume of air sampled, m<sup>3</sup> : 49.70
7. Avg. Ambient Temperature, °C : 38

### RESULTS

S. No.	Parameters	Method	*Requirement	Result
1.	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	APHA-Air (Improved West & Gaeke Method)	80 Max.	26
2.	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	Emission Regulation-III (Modified Jacob & Hochheiser Method)	80 Max.	29
3.	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	APHA-Air (Gravimetric)	100 Max.	90
4.	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	APHA-Air (Gravimetric)	60 Max.	41
5.	Carbon Monoxide (CO), mg/m <sup>3</sup>	IS: 5182 (P-10)	4 Max.	1.4

LPA-1986, PCLS/02/2010

Lab. No. 01/2017

Date: 03.05.2017

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Tech. Manager (Env.)

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