

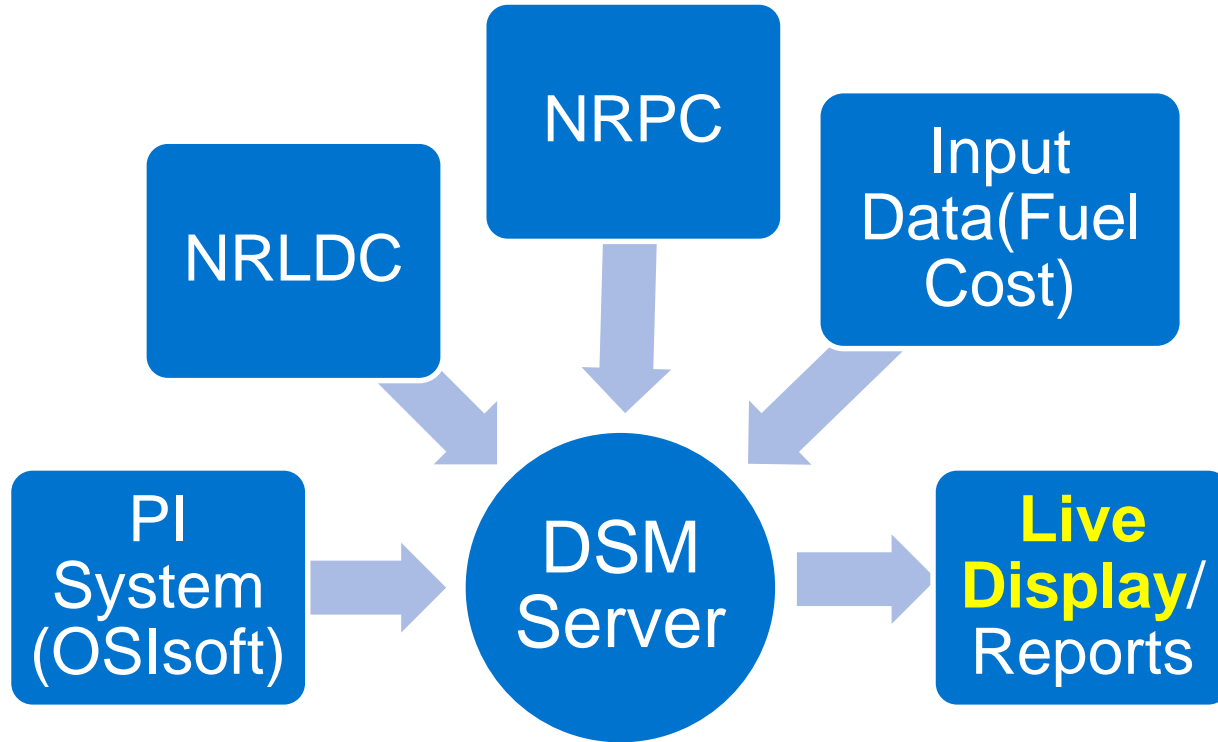
# DSM(ABT) SYSTEM 2.0

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**NTPC Limited**

# Software Features

1. DSM Ver 2.0 package is developed based on **CERC DSM 4<sup>th</sup> Amendment(2019-2024)**.
2. Auto update & Display of **Declared Capacity (DC) / Schedule Generation (SG)/ Revision Number / Last Revision Time** from NRLDC websites.
3. Auto update & Display of **ACP (Area Clearing Price)** exchange rates from NRPC (Northern Region Power Committee) websites for injection in price vector of DSM rates.
4. Auto update & Display of **Actual Generation (Gross) /Frequency / Net Export (AG) & other data from PI Server**.
5. Calculation and display of **Net UI / Deviation (AG-SG-AGC) / Violation direction / Violation Direction Count / Reset Direction Counter & Reset AG requirement**.
6. Upcoming Six Block **Schedule (SG)**.
7. Display of **Real Time Generation** Details.
8. Display of **Real Time Aux. Power** consumption (%).
9. Alarm/Alert Provided for revision from NRLDC site and during data loss from any source.
10. Display of SCED(Security Constrained Economic Dispatch) schedule.
11. Reports for DSM Calculation and as per MIS requirement.

# Software Architecture



# Live Screen Layout

NTPC				Home	NRLDC	Intranet	G-DAM	Fuel Cost(I)	Reports	Help	ABT (Ver 2.0)	Start	Stop	
Time	Blk	Rvn	Ins F	Avg F	ACP	STG-All		Issued Time 12-10-2019 09:52:00						
09:58:24	40	90	50.054	49.994	3.100		↓	SG(MW) for Next 6 Block						
Desc	ST-1	ST-2	Gas-GF	Gas-LF	Gas-RF	Solar	Desc	ST-1	ST-2	Gas-GF	Gas-LF	Gas-RF	Solar	
DC (MW)	768.60	464.27	795.00	0.00	573.00	2.20	09:45-10:00	211.37	252.71	222.00	0.00	0.57	2.20	
SG+A+R (MW)	211.37	262.49	222.57	0.00	0.57	2.20	10:00-10:15	211.37	253.18	222.00	0.00	0.57	2.30	
AG Inst (MW)	197.57	255.84	219.80	0.00	0.00	2.36	10:15-10:30	211.37	371.22	222.00	0.00	0.57	2.40	
AG Avg (MW)	207.52	256.55	219.98	0.00	0.00	2.28	10:30-10:45	212.00	389.62	222.00	0.00	0.57	2.50	
Ctr Reset (MW)	243.28	311.76	244.05	0.00	5.29	1.56	10:45-11:00	211.37	407.65	222.00	0.00	0.57	2.75	
Gross Gen	240.40	273.93	225.40	0.00	0.00	2.28	11:00-11:15	211.37	423.09	222.00	0.00	0.57	2.80	
APC(%)	13.68	6.35	2.41	NaN	NaN	0.00	Vio Counter	-	-	-	-	-	-	
NET UI (₹)	-309	-512	17	0	-432	-1	Dir Counter	-1	1	1	1	1	-1	
UI Rate (₹)	3.41	3.41	3.03	3.03	3.03	3.03	D.Prev.Cnt	1	-1	-1	-1	-1	1	
							Dev %	-1.82	-2.35	-1.17	-	-	-	
							ECR (₹)	3.99	3.70	3.03	3.03	3.03	3.03	
U#1	U#4	U#5	U#6	GT#1	GT#2	GT#3	GT#4	ST#2	Solar	U#5AGC				
119.89	111.75	269.42	1.10	0.38	0.15	62.13	62.39	98.00	2.36	9.50				
Solar	Rly-1	Rly-2	Stg1 ICT1		Stg1 ICT2		Stg1 ICT5		Stg2 ICT4					
2.36	9.49	25.01	67.51		66.26		63.81		255.84					
DSM✓		NRLDC✓		PI Server✓		Interface Server✓				OPC✓				
Developed by NTPC, All rights reserved												Gen SG Exp APC 742.0 689.4 686.3 7.5(%)		

# Alert in direction counter

DS  
M

Stage  
Selector

AG Sign  
Reversal

Alert On /  
Off

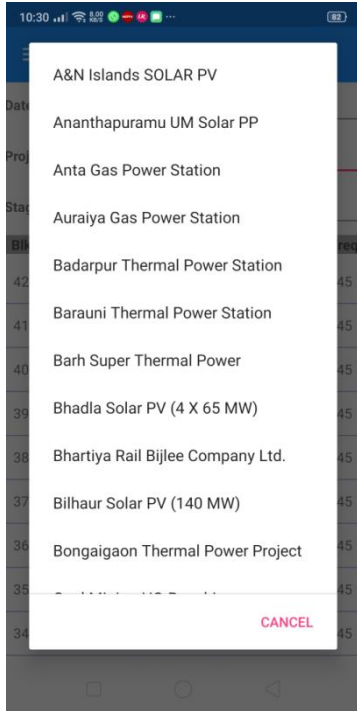
NTPC Home NRLDC Intranet G-DAM Fuel Cost(I) Reports Help DSM (Ver 2.0)									
Time	Blk	Rvn	Ins F	Avg F	ACP	STG-Thermal			
19:02:59	78	80	50.092	50.014	3.110				
Desc		ST-1		ST-2		Issued Time 19-03-2019 19:18:00			
DC (MW)		576.45		464.27		SG(MW) for Next 6 Block			
SG+A+R (MW)		468.72		321.94		Desc	ST-1	ST-2	
AG Inst (MW)		445.84		325.64		19:15-19:30	468.72	346.93	
AG Avg (MW)		431.58		340.19		19:30-19:45	528.72	396.93	
Ctr Reset (MW)		510.91		301.10		19:45-20:00	468.72	415.52	
Gross Gen		473.45		357.13		20:00-20:15	419.73	414.82	
APC(%)		8.84		4.74		20:15-20:30	395.37	415.52	
NET UI (₹)		5550		-2615		20:30-20:45	447.37	414.82	
UI Rate (₹)		2.49		2.49		Vio Counter	0	4	
U#1		U#2		U#3		Dir Counter	-5	1	
147.86		181.14		160.15		D.Prev.Cnt	-4	-1	
DSM✓		NRLDC✓		PI Server✓		Dev %	-7.92	5.26	
						ECR (₹)	3.69	3.69	
						U#5	U#6	U#5AGC	U#6AGC
						0.00	339.88	0.00	-25.00
						Interface Server✓			
						OPC✓			

# Analytics & Reports on Mobile App

- Unit start up & tripping information alerts on mobile app.
- Unit Load and other associated parameters.
- DSM parameters and its report.
- Environment parameters exceed warnings in the form of alerts.
- Operation Performance reports based on data fetched from PI System and user input.

# Screen Shot

## Stations



## Unit Load

Generation

Date: 12/10/2019

Project: [Redacted]

Stages: [Redacted]

Blk	U1	U4	DC	SG	AG	Tot	PLF	Freq
42	120	115	780.1	211.4	210.7	235	56	45
41	120	115	780.1	211.4	211.5	236	56.2	45
40	119	111	780.1	211.4	206.4	231	55	45
39	124	116	780.1	211.4	216.2	241	57.4	45
38	128	117	780.1	211.4	220.4	245	58.3	45
37	127	117	780.1	211.4	220.2	245	58.3	45
36	119	112	780.1	211.4	206.8	232	55.2	45
35	119	111	780.1	211.4	206	231	55	45
34	119	115	780.1	211.4	209.9	235	56	45

## DSM

Environment

AAQMS CEMS

Date: 12/10/2019

Desc	Time	Load	C Flow	PM	NOX	SO2
	Hour	Mw	H/tonne	mg/m3	mg/m3	mg/m3
U1		123	0	61	749	777
U2		0	0	0	66	-205
U3		1	0	0	108	-6
U4		115	0	48	716	752
U5		272	0	28	484	1146
U6	10:00	1	0	0	0	621
GT1		0	0	0	1	0
GT2		0	0	0	4	0
GT3		62	0	0	25	0
GT4		62	0	0	28	6
U1		124	0	60	704	742
U2		0	0	0	66	-205
U3		1	0	0	113	-6
U4		116	0	36	719	745
U5		269	0	28	474	1150
U6	09:00	1	0	0	0	621
GT1		0	0	0	0	0

## Environment

DSM Data Details

ST-1

Date: 12 October 2019

B No	DC	SG	AG	AGC	Freq	Update
42	768.6	211.37	204.84	0	50	10:27
41	768.6	211.37	207.26	0	49.97	10:16
40	768.6	211.37	206.67	0	50	10:01
39	768.6	211.37	206.51	0	50	09:45
38	768.6	211.37	207.83	0	49.99	09:30
37	768.6	211.37	204.04	0	49.99	09:15
36	768.6	211.37	201.56	0	50.04	09:00
35	768.6	211.37	201.98	0	50.03	08:45
34	768.6	211.37	203.8	0	50.03	08:30
33	768.6	211.37	201.56	0	50.06	08:16

# Web Based Reports

- 1. NRLDC Schedule detail
- 2. DSM Calculation detail.
- 3. Violation detail.
- 4. SG Mismatch wrt implemented schedule.
- 5. MIS Reports as per requirement



# NRLDC- Schedule

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[Fuel Cost\(I\)](#)
[Reports ▾](#)
[Help](#)
[ABT \(Ver 2.0\)](#)

Date **12/10/2019**
Revision No **91**
Last Revision Date **2019-10-12 10:03:00**
Stage **ST-1 ▾**

Stage Name	Block No	Block Time	DC	ISGS	LTA	MTOA	Shared	Bilateral	IEX	PXIL	ANCL_UP	ANCL_DOWN	RRAS	URS	SCED	Total
DADRIT	1	00:00-00:15	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	2	00:15-00:30	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	3	00:30-00:45	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	4	00:45-01:00	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	5	01:00-01:15	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	6	01:15-01:30	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	7	01:30-01:45	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	8	01:45-02:00	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	9	02:00-02:15	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	10	02:15-02:30	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	11	02:30-02:45	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	12	02:45-03:00	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	13	03:00-03:15	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	14	03:15-03:30	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	15	03:30-03:45	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	16	03:45-04:00	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	17	04:00-04:15	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	18	04:15-04:30	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	19	04:30-04:45	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700
DADRIT	20	04:45-05:00	768.6000	211.3700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	211.3700

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# Deviation Report(Live)

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Date:  Stage:

Date: 2019-10-12 SFC: 0.6060 Stage 1(Live) Fuel Rate: 5092(Effective Date: 2019-01-02)

Block No	Time Block	DC(MW)	SG(MW)	Ramp Up	Ramp Down	AGC AVG	SG+ AGC(MW)	AG(MW)	Deviation(MW)	Deviation %	UIRate	Frequency	SFC	UI Amount	Add. UI	Fuel Cost	DSM
1	00:00-00:15	768.60	211.37	0.00	0.00	0.00	211.37	207.82	-3.55	-1.68	3.41	49.99	0.6060	-3025.71	0.00	-2741.02	-284.69
2	00:15-00:30	768.60	211.37	0.00	0.00	0.00	211.37	208.11	-3.26	-1.54	3.71	49.98	0.6060	-3024.16	0.00	-2513.62	-510.54
3	00:30-00:45	768.60	211.37	0.00	0.00	0.00	211.37	207.15	-4.22	-2.00	3.99	49.95	0.6060	-4206.58	0.00	-3253.25	-953.33
4	00:45-01:00	768.60	211.37	0.00	0.00	0.00	211.37	207.26	-4.11	-1.95	3.99	49.95	0.6060	-4101.60	0.00	-3172.06	-929.54
5	01:00-01:15	768.60	211.37	0.00	0.00	0.00	211.37	206.36	-5.01	-2.37	3.71	49.98	0.6060	-4648.70	0.00	-3863.90	-784.80
6	01:15-01:30	768.60	211.37	0.00	0.00	0.00	211.37	206.51	-4.86	-2.30	3.41	49.99	0.6060	-4139.04	0.00	-3749.59	-389.45
7	01:30-01:45	768.60	211.37	0.00	0.00	0.00	211.37	204.63	-6.74	-3.19	3.10	50.00	0.6060	-5225.37	0.00	-5201.35	-24.02
8	01:45-02:00	768.60	211.37	0.00	0.00	0.00	211.37	204.61	-6.76	-3.20	3.41	49.99	0.6060	-5756.73	0.00	-5215.08	-541.65
9	02:00-02:15	768.60	211.37	0.00	0.00	0.00	211.37	206.26	-5.11	-2.42	3.71	49.98	0.6060	-4746.99	0.00	-3945.60	-801.39
10	02:15-02:30	768.60	211.37	0.00	0.00	0.00	211.37	206.51	-4.86	-2.30	3.99	49.97	0.6060	-4847.75	0.00	-3749.11	-1098.64
11	02:30-02:45	768.60	211.37	0.00	0.00	0.00	211.37	207.27	-4.10	-1.94	3.99	49.96	0.6060	-4092.22	0.00	-3164.81	-927.41
12	02:45-03:00	768.60	211.37	0.00	0.00	0.00	211.37	206.94	-4.43	-2.10	3.10	50.00	0.6060	-3436.25	0.00	-3420.46	-15.79
13	03:00-03:15	768.60	211.37	0.00	0.00	0.00	211.37	203.24	-8.13	-3.85	2.48	50.01	0.6060	-5042.56	0.00	-6274.23	1231.67
14	03:15-03:30	768.60	211.37	0.00	0.00	0.00	211.37	204.89	-6.48	-3.07	3.10	50.00	0.6060	-5020.98	0.00	-4997.91	-23.07
15	03:30-03:45	768.60	211.37	0.00	0.00	0.00	211.37	206.34	-5.03	-2.38	2.48	50.01	0.6060	-3115.93	0.00	-3877.01	761.08
16	03:45-04:00	768.60	211.37	0.00	0.00	0.00	211.37	204.06	-7.31	-3.46	1.86	50.02	0.6060	-3398.97	0.00	-5638.91	2239.94
17	04:00-04:15	768.60	211.37	0.00	0.00	0.00	211.37	203.78	-7.59	-3.59	3.10	50.00	0.6060	-5881.59	0.00	-5854.56	-27.03
18	04:15-04:30	768.60	211.37	0.00	0.00	0.00	211.37	202.66	-8.71	-4.12	2.48	50.01	0.6060	-5403.10	0.00	-6722.83	1319.73
19	04:30-04:45	768.60	211.37	0.00	0.00	0.00	211.37	203.53	-7.84	-3.71	3.10	50.00	0.6060	-6076.10	0.00	-6048.17	-27.93

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- Questions?

*Thank You*