Oral Hearing
Before the Honourable
Central Electricity Regulatory Commission on
'Draft Regulations on Terms and Conditions of Tariff for the period 2009-14'

3rd and 4th November 2008
New Delhi

Submission on behalf of all the RLDCs and NLDC

by

Corporate System Operation Department, POWERGRID

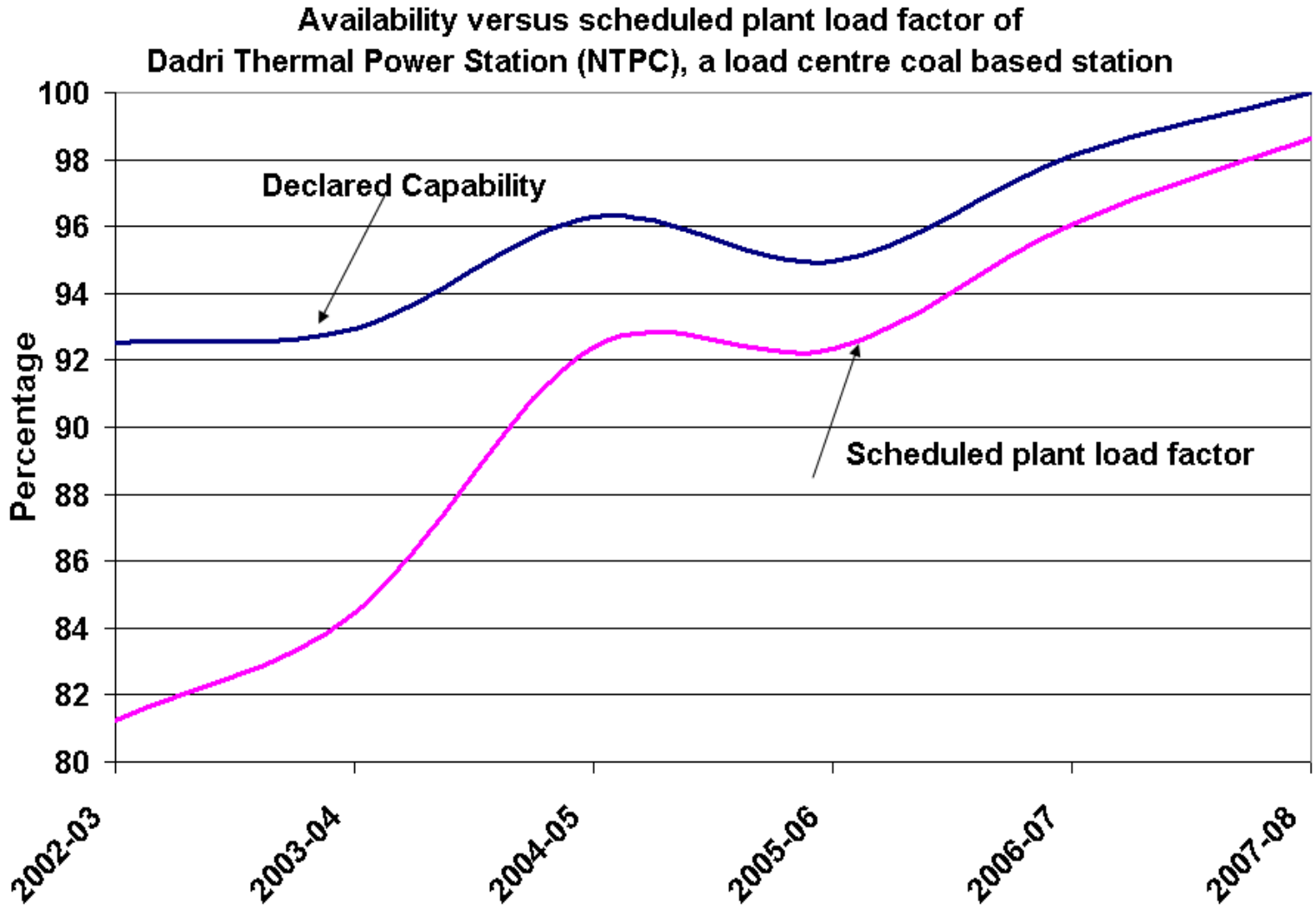
Expectations from the Tariff Regulations

- Ensuring reliability of the bulk electric power system
- Achieving economy and efficiency
- Ease of understanding and implementation
- Avoiding Market Distortion.

Incentive based on availability

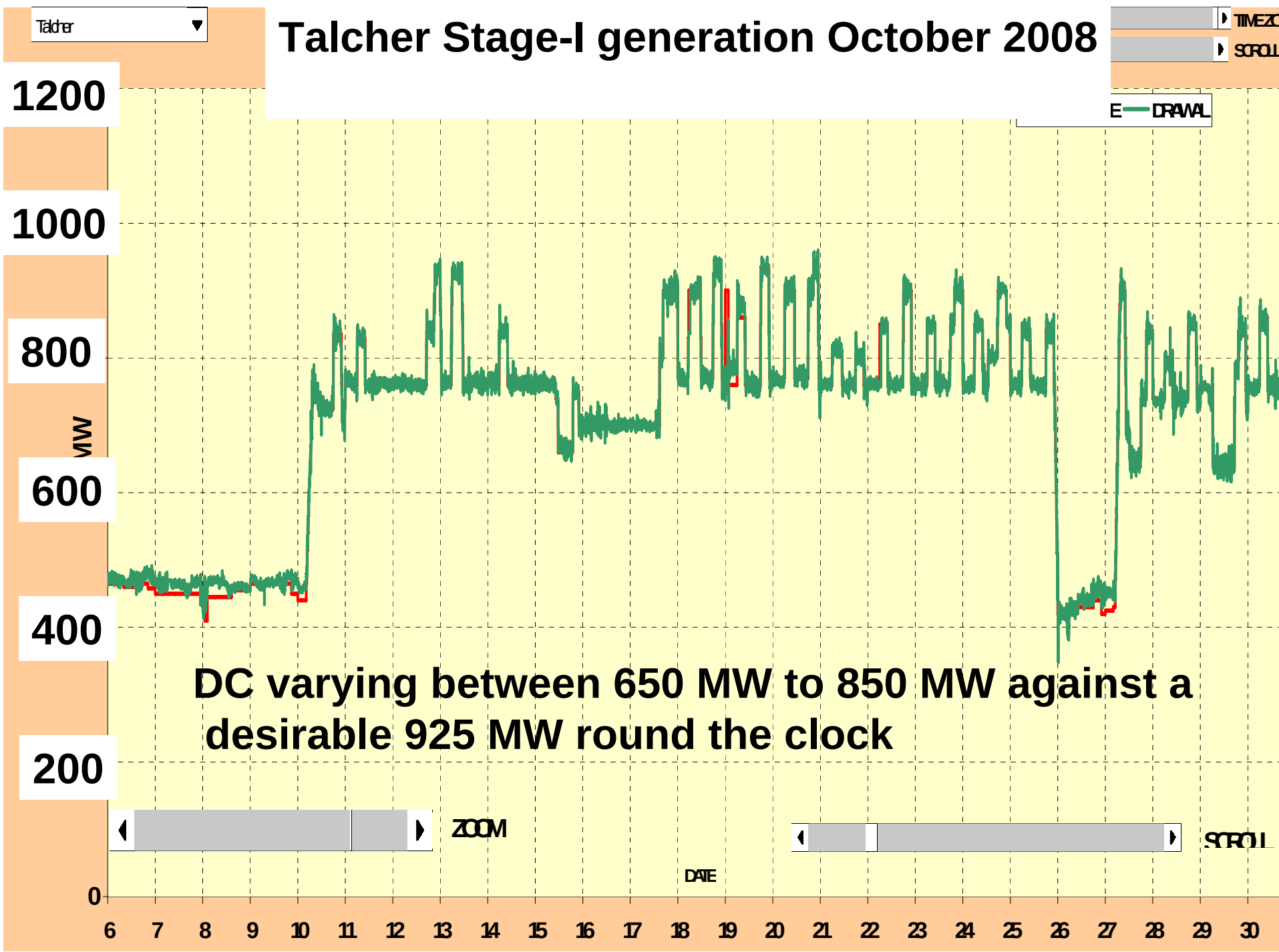
- Difficulty on account of
  - Energy shortages expected during 2009-14
  - Fuel crisis
  - Fuel supply risk
  - Value of Availability
  - Incentive amount would depend on plant vintage

Load centre based coal fired stations are scheduled fully due to Energy shortage, interconnection of grids, commercial mechanism and interstate open access



Coal shortage

- Fifty (50) stations having less than seven days coal stock as on 30th Sep 2008
- Reasons varied
  - Inadequate linkage
  - Receipts only 50-80% of the linkage
  - Law and order problems
  - Management problems
  - Higher generation and inadequate linkage
- Coal shortage a serious concern for even pit head plants


Talcher
Talcher Stage-I generation October 2008
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SCROLL
E
DRAWAL
1200
1000
800
600
400
200
0
MW
DC varying between 650 MW to 850 MW against a desirable 925 MW round the clock
ZOOM
SCROLL
DATE
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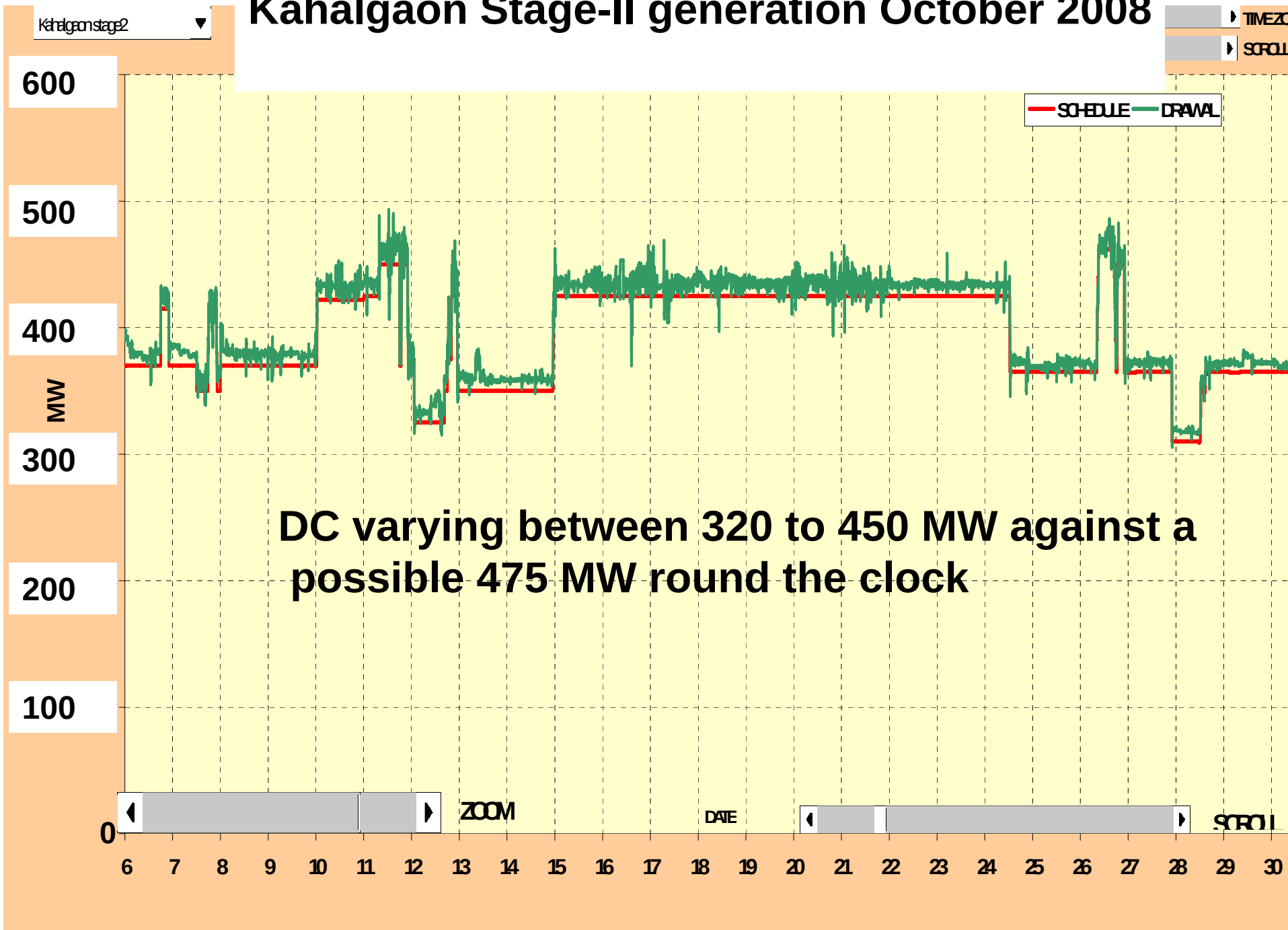
29
30

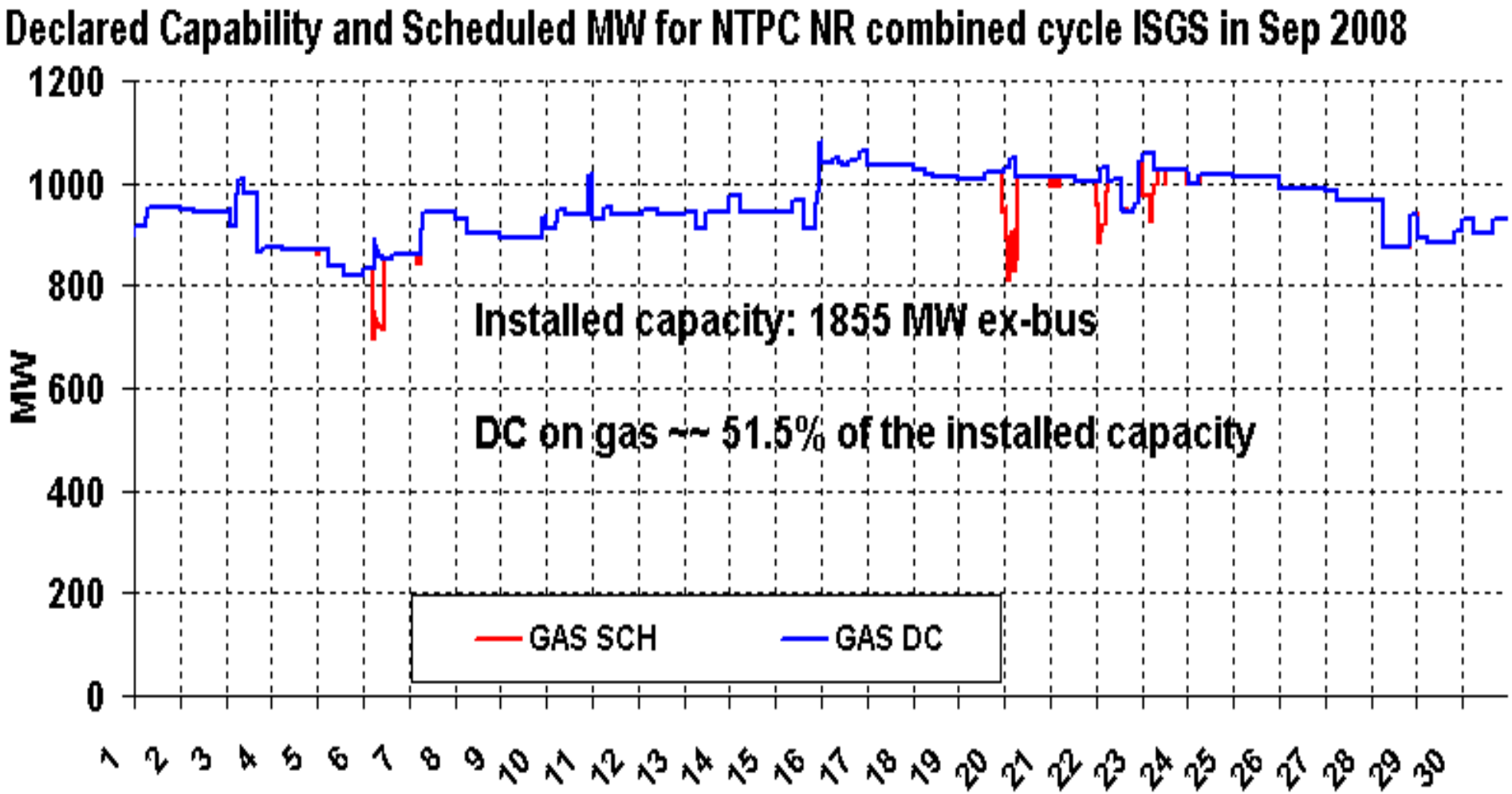
Kahalgaon Stage-II generation October 2008



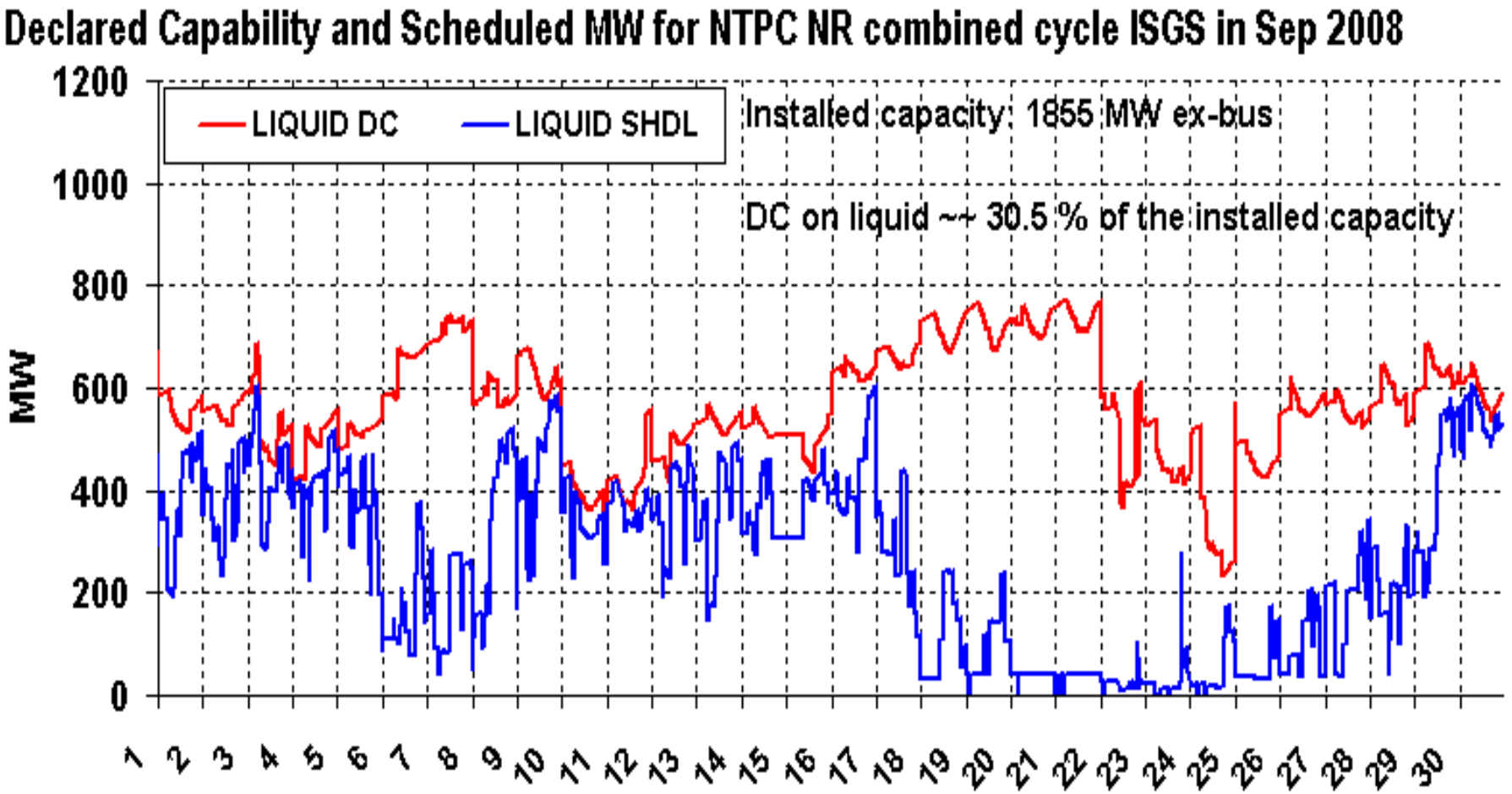
Suggestion on Coal

- Availability should be based on round-the-clock and not 8-hour availability
- Incentive should continue to be based on scheduled plant load factor
- The incentive amount might be substantially raised from the present 25 paise/kWh in a graded fashion to recognize the extra efforts

Incentive based on peak hour generation for combined cycle plants



Incentive based on peak hour generation for combined cycle plants



Only 46% of the declared capability on liquid fuel was scheduled despite frequency below 49.5 Hz for 62% of the time

Incentive based on peak hour generation for combined cycle plants

- Natural gas under Administered Pricing Mechanism (APM)…..only 55% requirement being met in NR
- Liquid fuel only a standby arrangement
- Day ahead availability
- 85-90% availability achieved by these plants basically on account of low liquid schedule
- Sustained availability on liquid fuel not possible in view of limited storage

Incentive based on peak hour generation for combined cycle plants

- Draft Regulations provide for availability based on peak hour schedule
- If UI ceiling rate << liquid fuel rate, monthly average of peak hour schedule would be of the order of 50%.
- Availability based on peak hour schedule would be of the order of 70% only in NR.
- Target availability of 85% not achievable

Suggestion on Gas/Liquid

- **Continue with round-the-clock day ahead availability & incentive based on scheduled plf**
- **To facilitate scheduling of liquid fuel in a shortage situation**
  - **Define Value of Lost Load (VOLL)**
  - **Review UI ceiling rates periodically**
  - **Limit over-drawal below 49.5 Hz through a combination of commercial mechanism and penal measures**

Fixed charge payment and reliability support

- ***Generators are expected to provide reliability support in the form of***
  - ***Primary response, short-term overload, peaking, ramping up/down***
  - ***Reactive power generation/absorption, synchronous condenser operation***
  - ***Facilitation of implementation of System Protection Scheme***
  - ***Black start***
- ***Payment of a part of the Annual Fixed Charges (AFC) could be linked to the availability of reliability support from the generator. Such a provision would induce generators to respond to grid reliability requirements and thus facilitate enforcement of IEGC provisions.***

Fixed charge payment and reliability support

- Normative secondary fuel oil consumption included as fixed cost

- Need for generators to take secondary oil support in a load crash situation

Suggestion on Reliability

- Set aside a certain portion of fixed charges to be paid only if
  - Participation of generator in black start exercises
  - Provide reactive power support within equipment ratings
  - Operate synchronous condenser facility, whenever required as per Grid Connectivity Standards
  - Primary response and ramping up/down whenever required

Comments: Date of Commercial Operation

- Definitions: (14) date of commercial operation or COD
  - COD only from 00:00 hours of the day might be explicitly stated in the Regulations
  - For advancing the date of commissioning of transmission system, advise of CEA/RPCs/RLDCs should be duly considered
  - Clarification on COD, if bay equipment and line ownership is different

Comments : Recovery of Fixed Charges

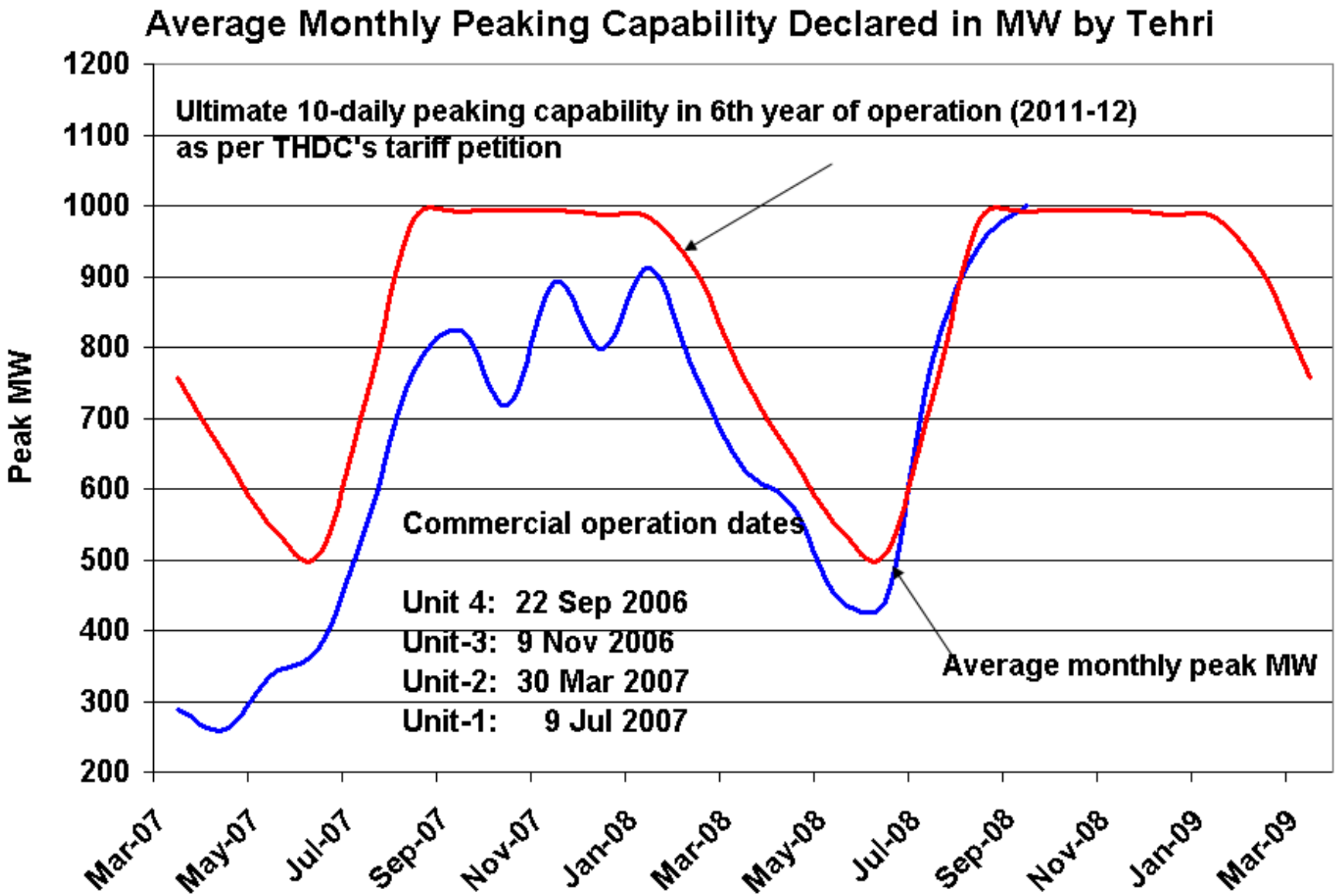
- Chapter 4 (21) Recovery of fixed charge
  - Seasonal target availability decided by stakeholders in a decentralized fashion
  - Would encourage better planning of maintenance schedules and better reliability of the power system

Hydro tariff comments

- Approach in Draft regulations AFC centric
- Different behaviour of plants in real time depending on their vintage whereas grid operation demands a similar response from all hydro plants of the same type irrespective of the vintage. (frequency linked despatch guidelines).

Hydro tariff comments

- Draft notification on Availability Based Tariff (ABT) issued in May 1999, the weightage assigned to different factors were as under:
  - Run-of-the river hydro stations: 100% weightage to energy
  - Pondage based stations: 50% weightage to peaking and rest to energy.
  - Storage based hydro: 100% weightage to peaking.


Average Monthly Peaking Capability Declared in MW by Tehri
Peak MW
1200
1100
1000
900
800
700
600
500
400
300
200
Ultimate 10-daily peaking capability in 6th year of operation (2011-12)
as per THDC's tariff petition
Commercial operation dates
Unit 4: 22 Sep 2006
Unit-3: 9 Nov 2006
Unit-2: 30 Mar 2007
Unit-1: 9 Jul 2007
Average monthly peak MW
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09

Suggestions on Hydro

- For run-off-the river, recover entirely in terms of energy charges.
- For storage and ROR with pondage, have 50% recovered through Capacity charge and seasonal availability targets based on hydrology
- Low value of energy charge (in paise/kWh) during high hydro and high value during lean season.
- Over-recovery or under-recovery could be split 50:50 between the generator and beneficiaries
- Would ensure proper despatch signal as well as uniform cash flow

Suggestions on Hydro (contd…)

- **Present arrangement of 3rd day adjustment of extra/less energy generated with respect to forecast values is beneficial in terms of:**
  - Better flexing of generation by plants
  - Less number of revisions in schedule
  - Takes care of 12% free power to home state

- **Revisions being accepted by RLDCs once a day for ± 15% variation in inflows wrt initial forecast**

- **Need to incorporate these in the new Regulations**

Transmission Tariff Regulations

- **In Regulation 33 regarding sharing of transmission charges, provisions may be made for any changes in the formula for sharing of transmission charges depending on distance and direction sensitivity as per section 5.3.5 of the National Electricity Policy.**

- **Transmission charges be worked out separately for ICTs, bus reactors, SVCs and AC lines similar to that being worked out for HVDC system and paid separately based on the availability.**

- **Like SVCs, Fixed Series Capacitors (FSCs) and Thyristor Controlled Series Capacitors (TCSC) might be considered as a separate asset pool.**

- **Availability calculations in a multiple transmission licensee scenario**

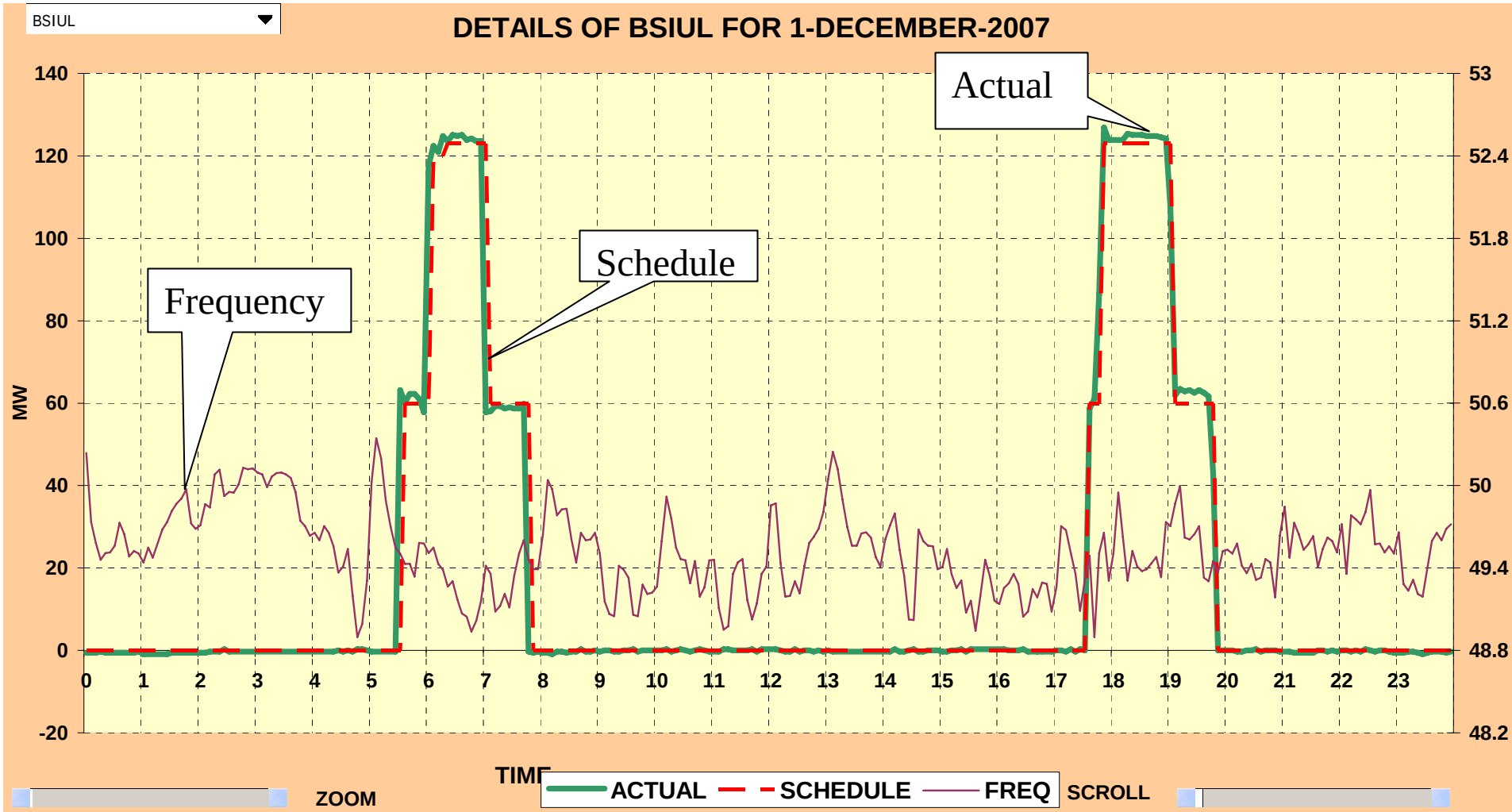
Suggestions on Reliability

- The following factors affect the reliability of the power system:
  - More than a certain number of trippings per year.
  - Faults causing more than one element tripping due to undesirable operation of the protective systems.
  - Multiple tripping of lines and/or generating units leading to loss of generation and/or load.
- Each factor adequately captured in the fixed charge recovery by Generating Companies and inter state transmission licensees. (including those through competitive bidding)

Thank you

Hydro Plants Operation before

07th January 2008


BSIUL
DETAILS OF BSIUL FOR 1-DECEMBER-2007
Actual
Schedule
Frequency
MW
140
120
100
80
60
40
20
0
-20
53
52.4
51.8
51.2
50.6
50
49.4
48.8
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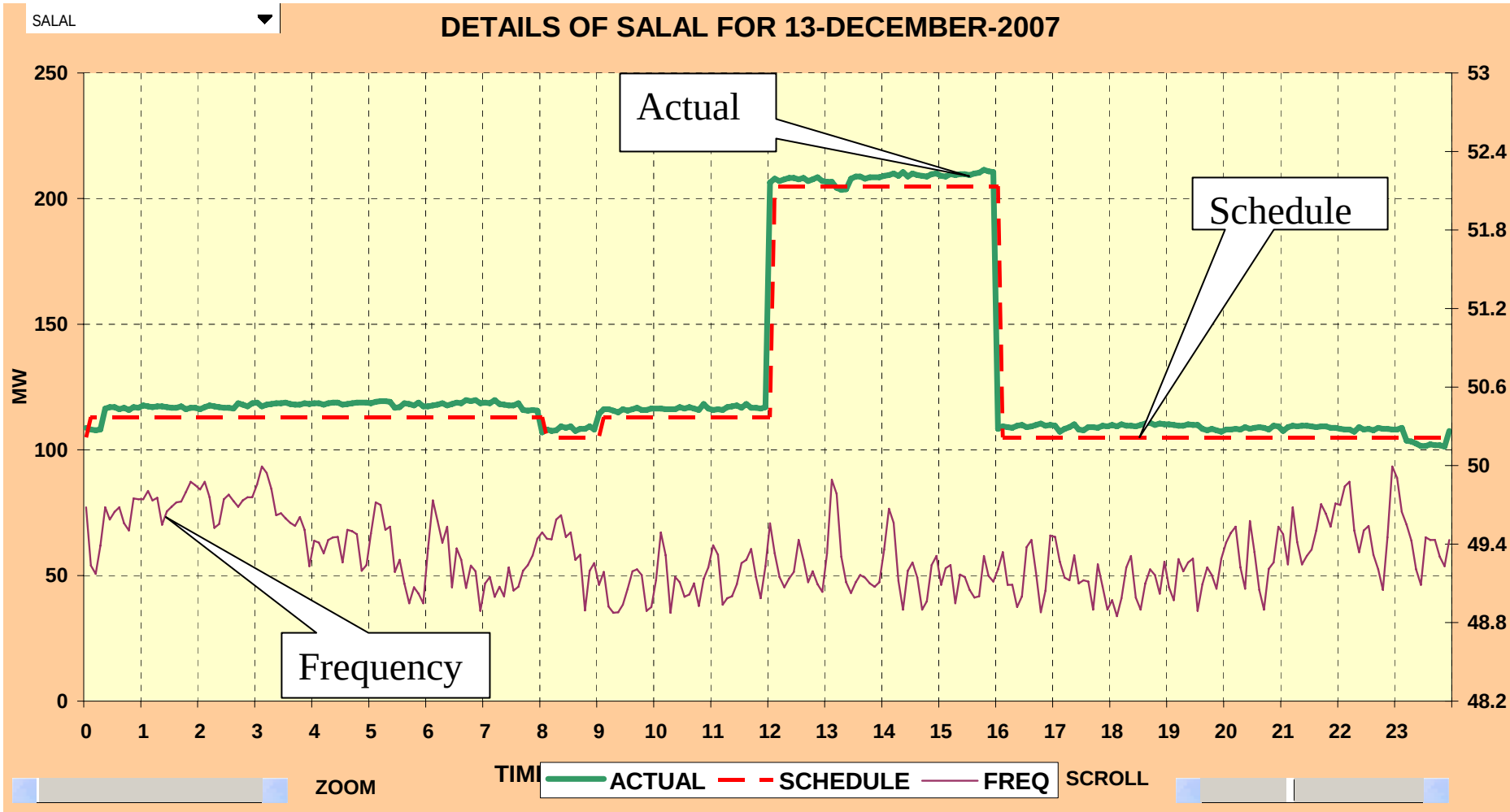
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL


SALAL
DETAILS OF SALAL FOR 13-DECEMBER-2007
Actual
Schedule
Frequency
MW
250
200
150
100
50
0
53
52.4
51.8
51.2
50.6
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49.4
48.8
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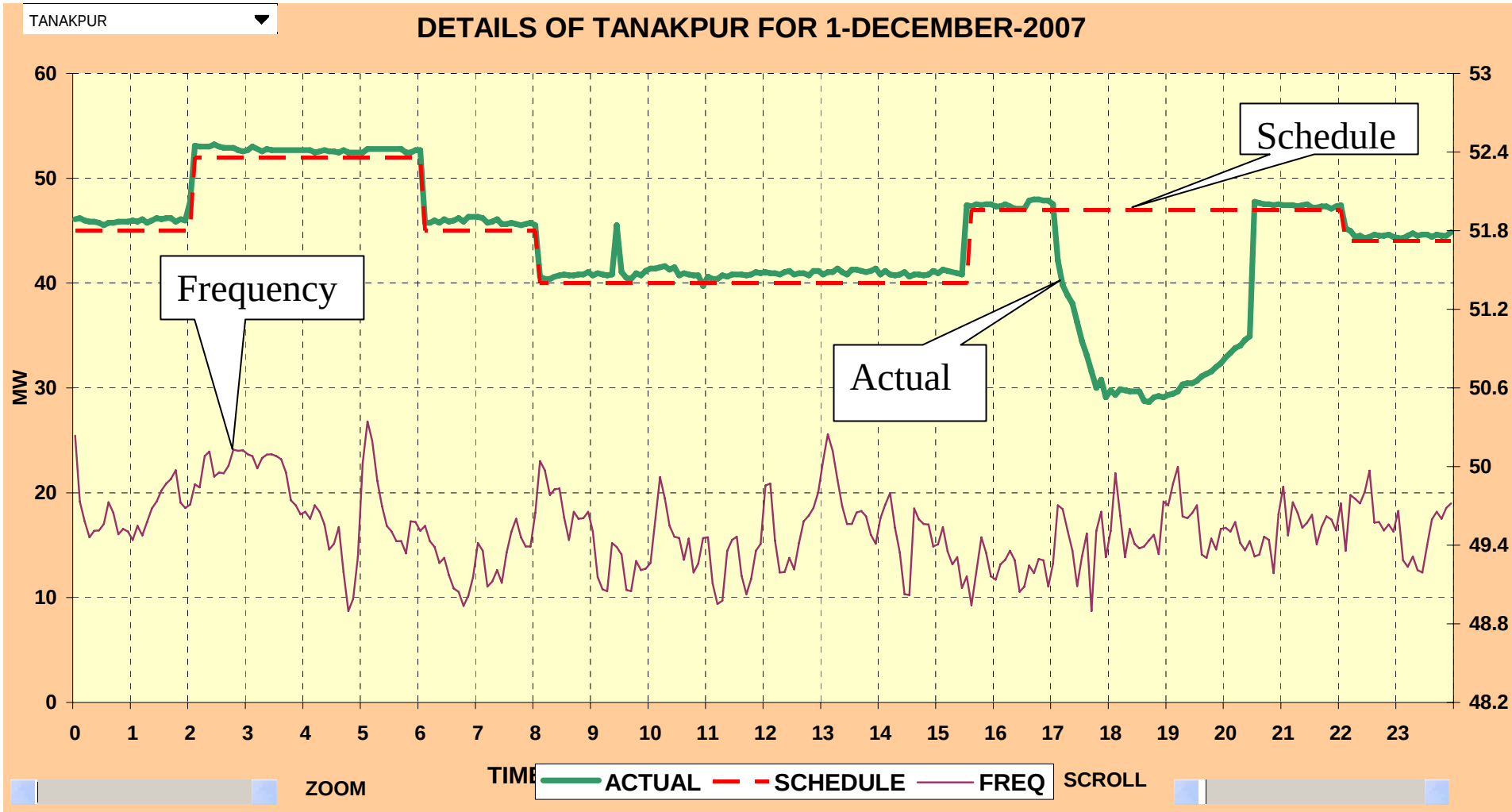
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL


TANAKPUR
DETAILS OF TANAKPUR FOR 1-DECEMBER-2007
MW
60
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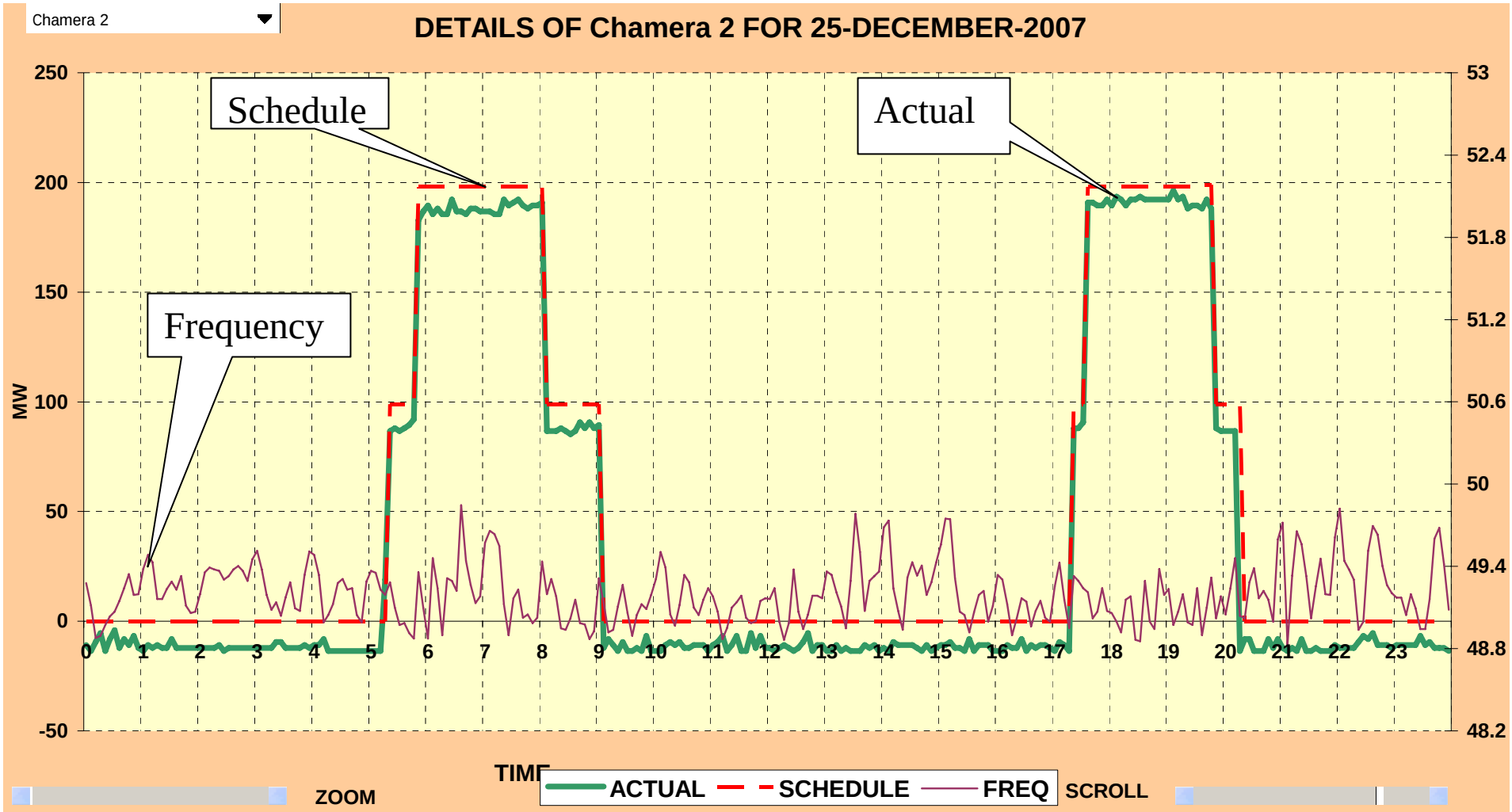
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Schedule
Frequency
Actual
ZOOM
TIME
ACTUAL
SCHEDULE
FREQ
SCROLL


Chamera 2
DETAILS OF Chamera 2 FOR 25-DECEMBER-2007
Schedule
Actual
Frequency
MW
250
200
150
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-50
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52.4
51.8
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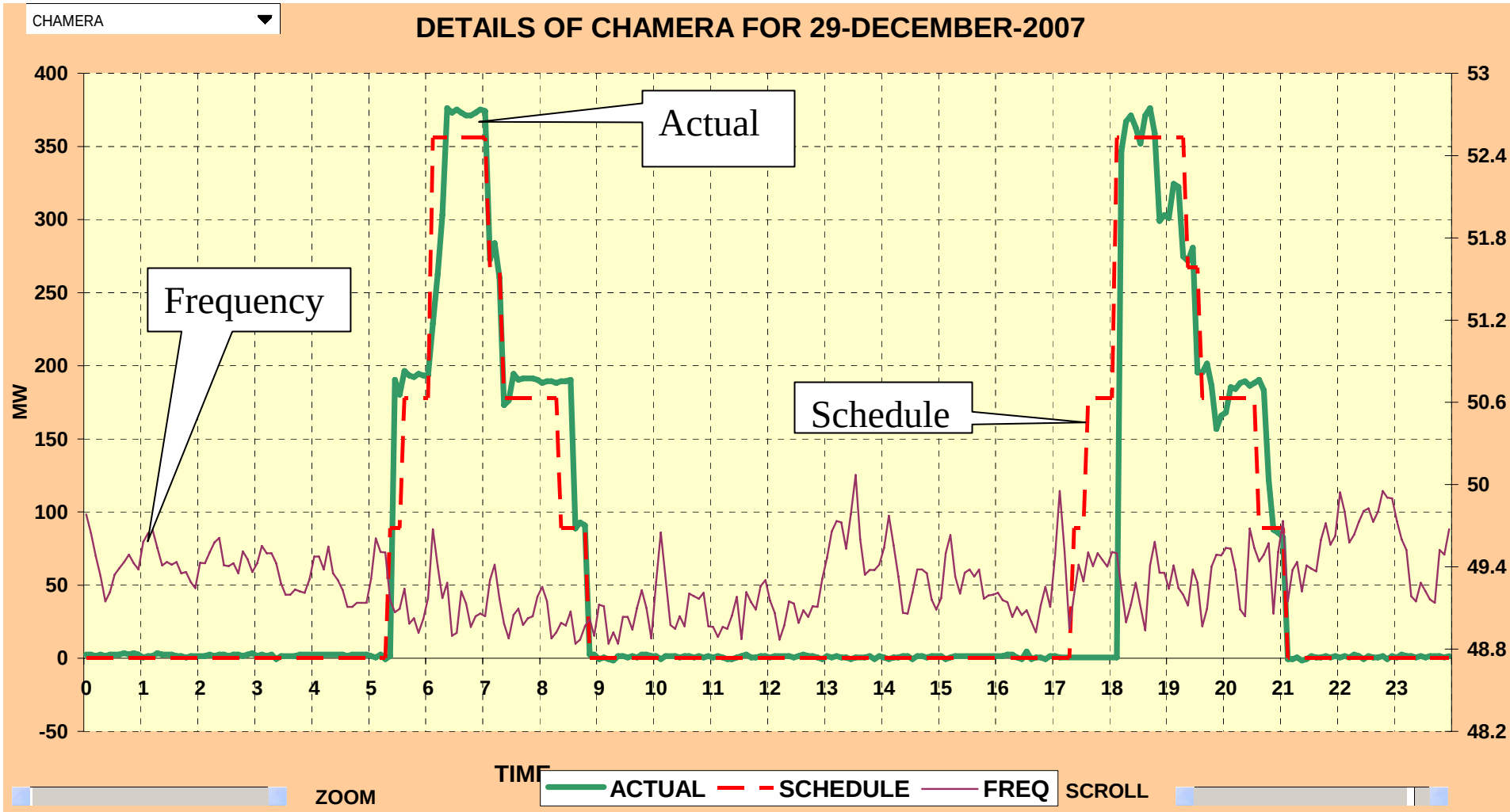
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL


CHAMERA
DETAILS OF CHAMERA FOR 29-DECEMBER-2007
Actual
Frequency
Schedule
MW
400
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250
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-50
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52.4
51.8
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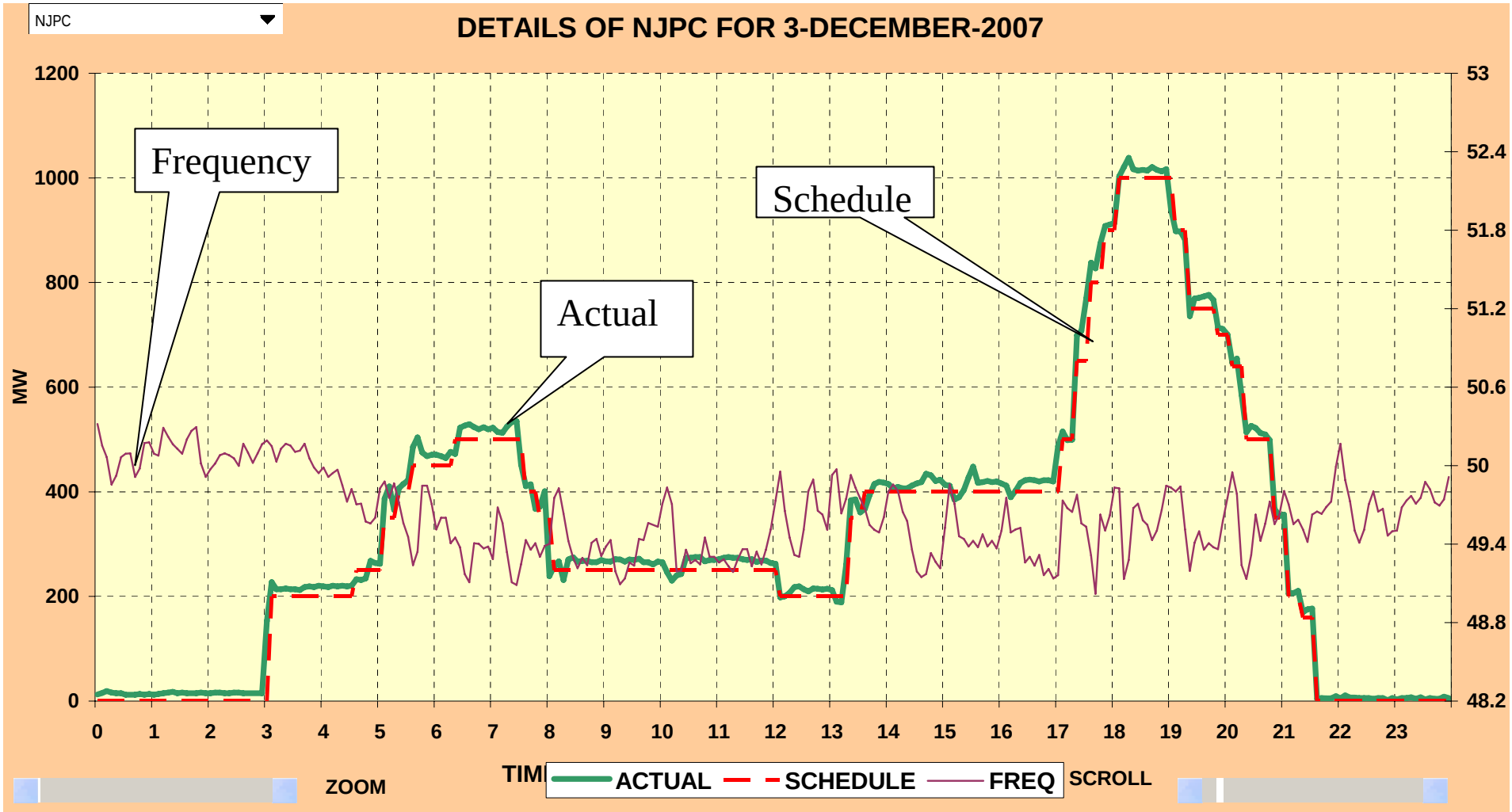
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL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DETAILS OF NJPC FOR 3-DECEMBER-2007
Frequency
Actual
Schedule
MW
1200
1000
800
600
400
200
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52.4
51.8
51.2
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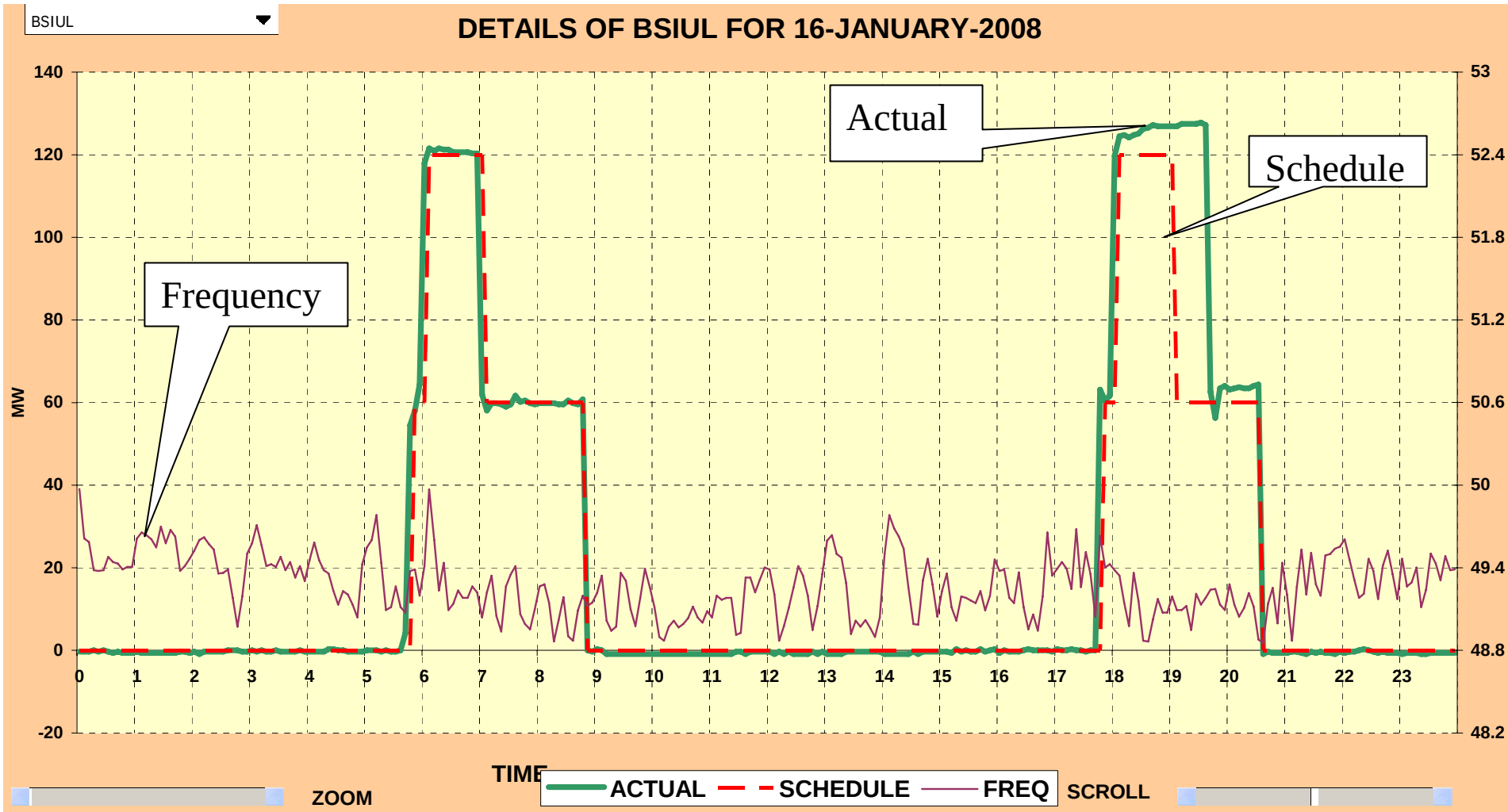
49.4
48.8
48.2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
ZOOM
TIM
ACTUAL
SCHEDULE
FREQ
SCROLL

Hydro Plants Operation After

07th January 2008

(plants operator following frequency signal more vividly)


BSIUL
DETAILS OF BSIUL FOR 16-JANUARY-2008
Actual
Schedule
Frequency
MW
140
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-20
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52.4
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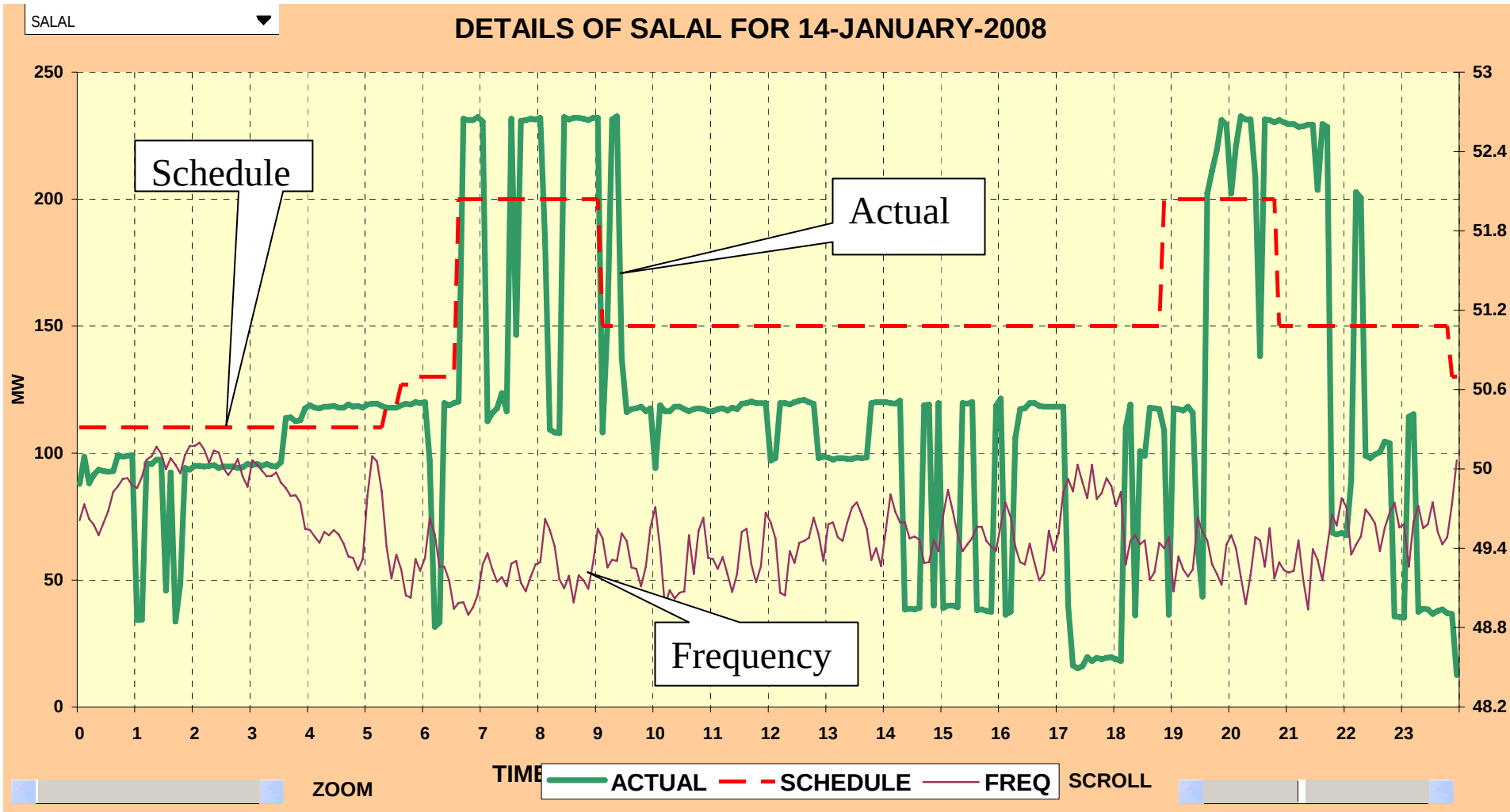
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL


SALAL
DETAILS OF SALAL FOR 14-JANUARY-2008
Schedule
Actual
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MW
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TIME
ACTUAL
SCHEDULE
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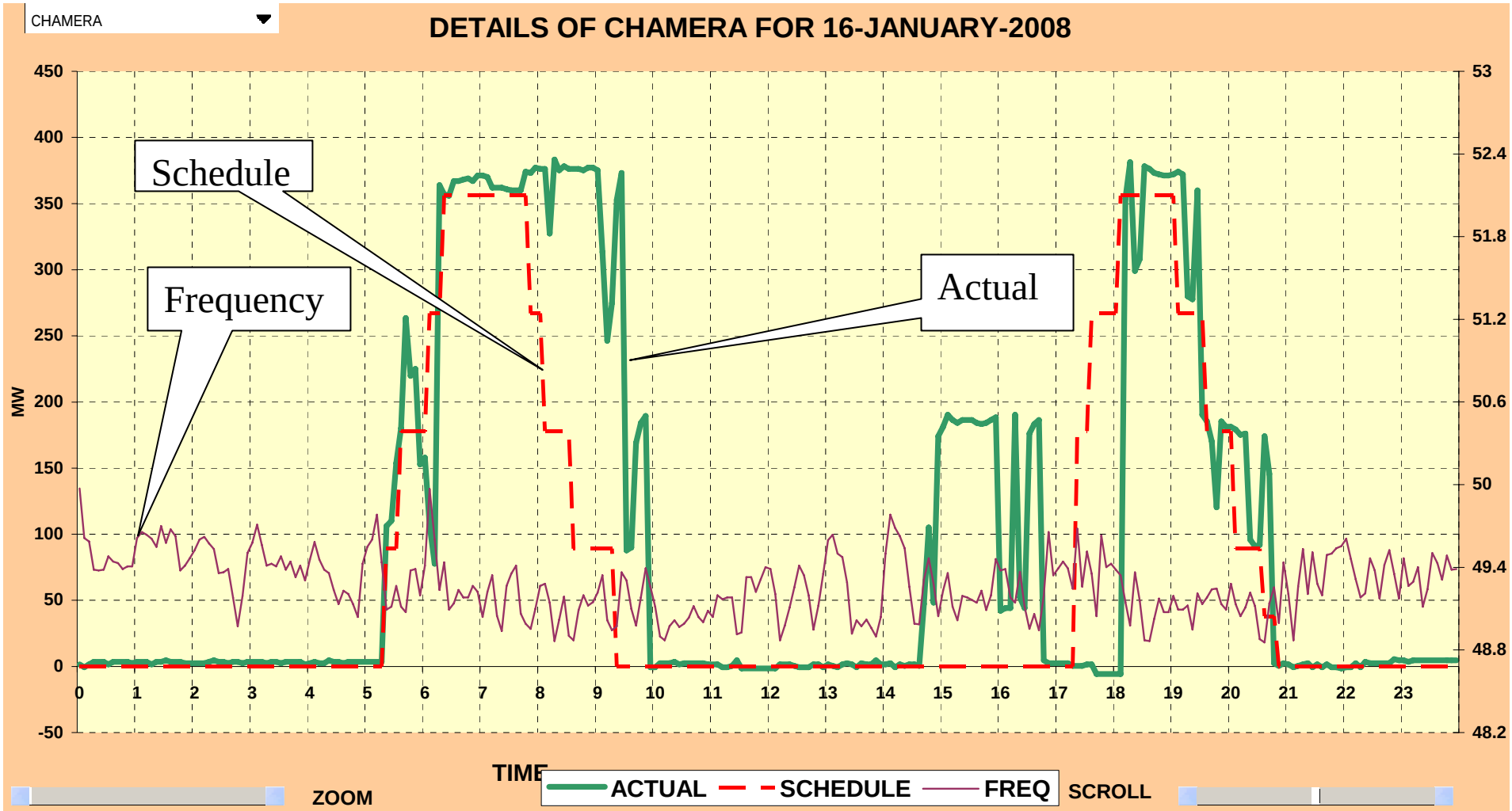
CHAMERA
DETAILS OF CHAMERA FOR 16-JANUARY-2008
Schedule
Frequency
Actual
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450
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TIME
ACTUAL
SCHEDULE
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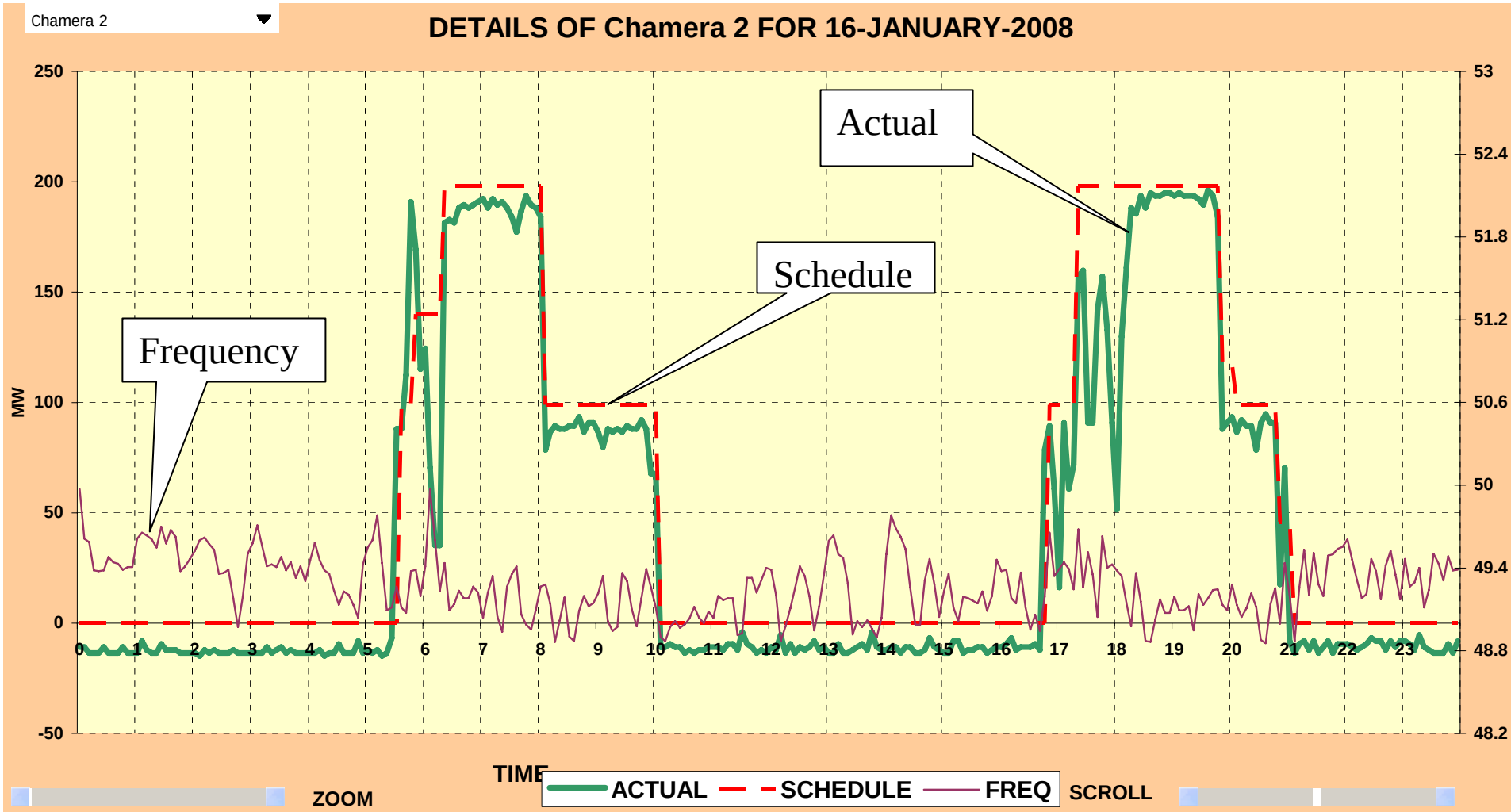
Chamera 2
DETAILS OF Chamera 2 FOR 16-JANUARY-2008
Actual
Schedule
Frequency
MW
250
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-50
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TIME
ACTUAL
SCHEDULE
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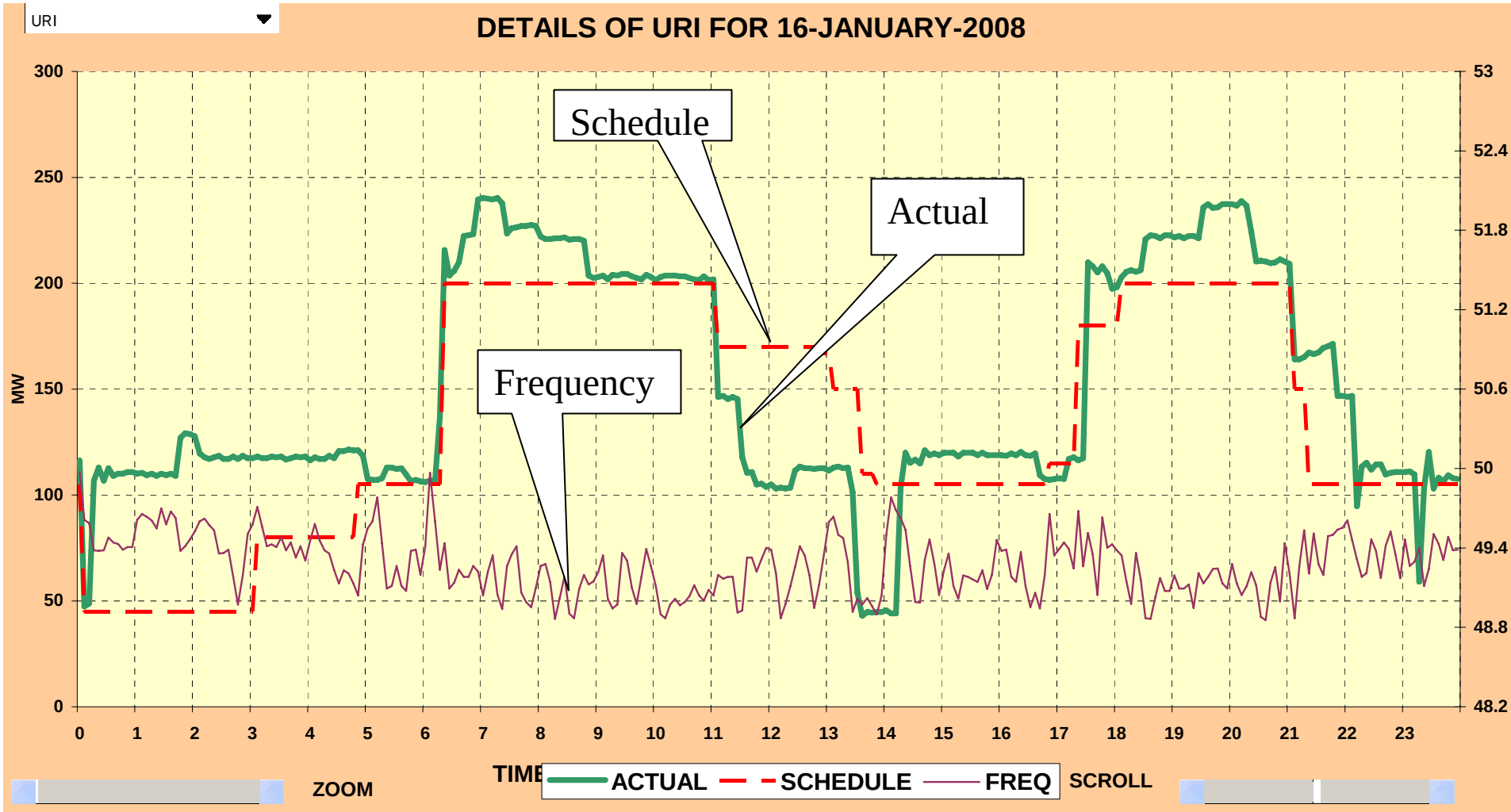
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DETAILS OF URI FOR 16-JANUARY-2008
Schedule
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49.4
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TIME
ACTUAL
SCHEDULE
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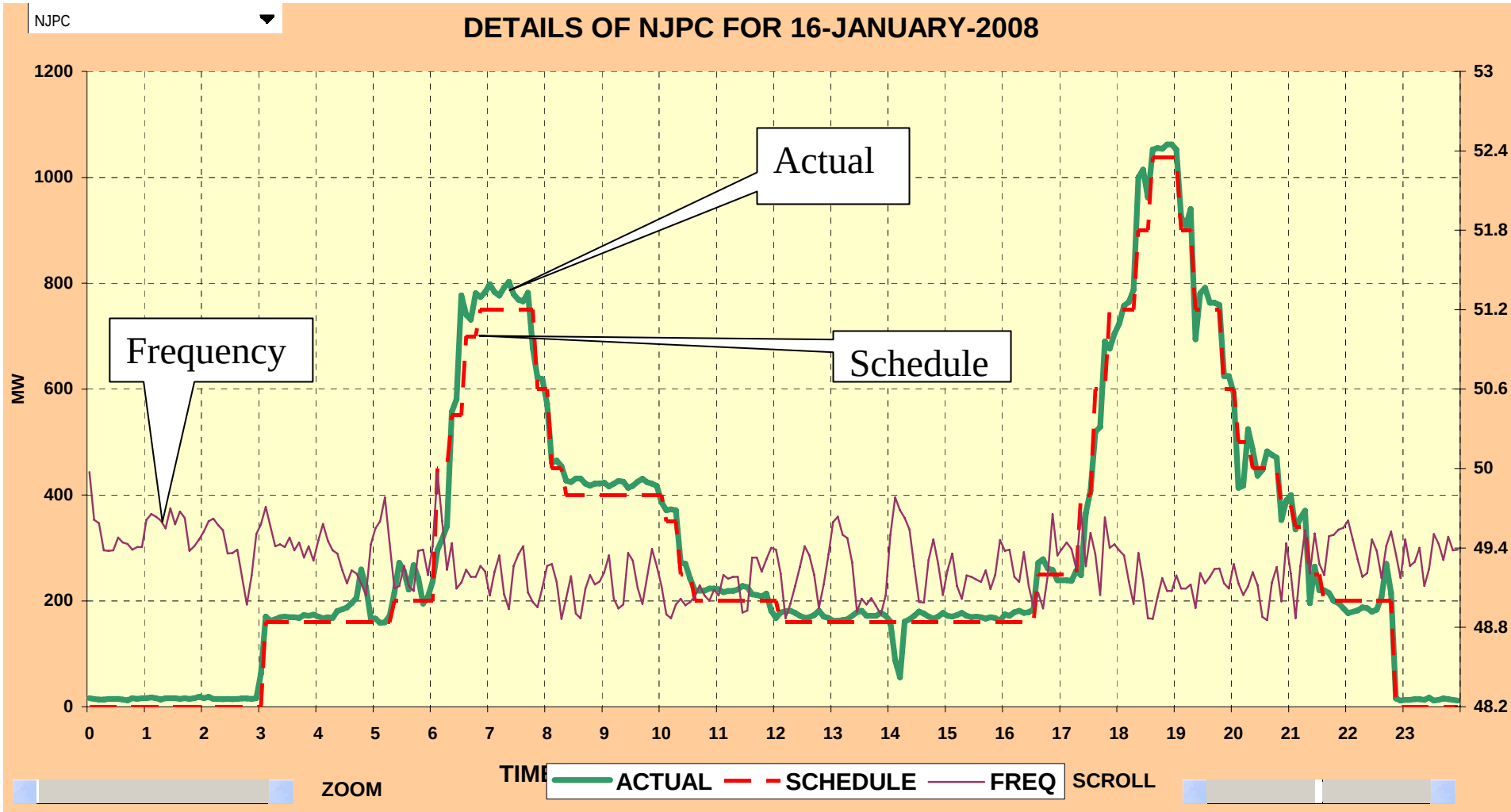
NJPC
DETAILS OF NJPC FOR 16-JANUARY-2008
Actual
Schedule
Frequency
MW
1200
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TIME
ACTUAL
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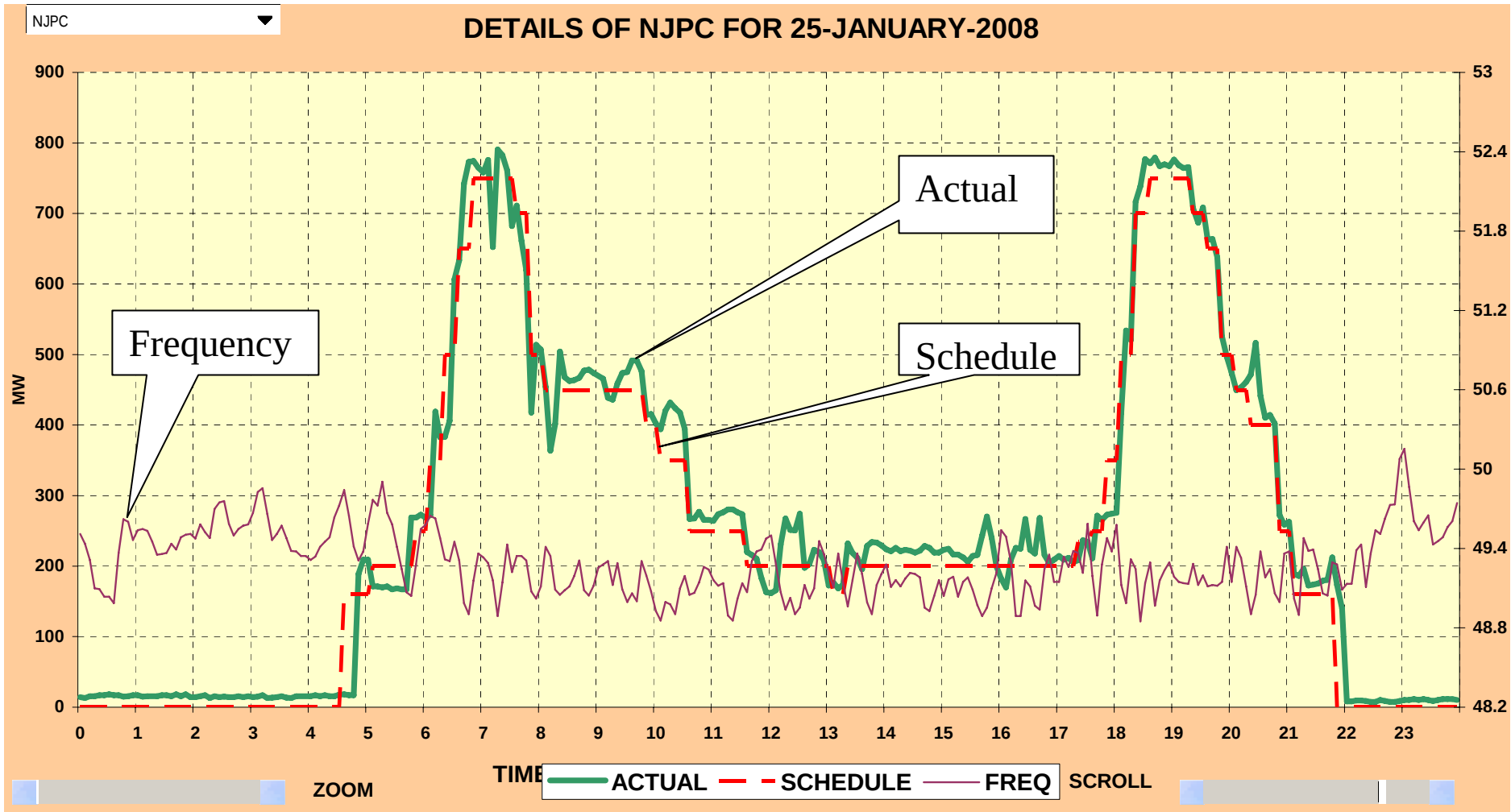
NJPC
DETAILS OF NJPC FOR 25-JANUARY-2008
MW
900
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51.8
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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Actual
Schedule
Frequency
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ACTUAL
SCHEDULE
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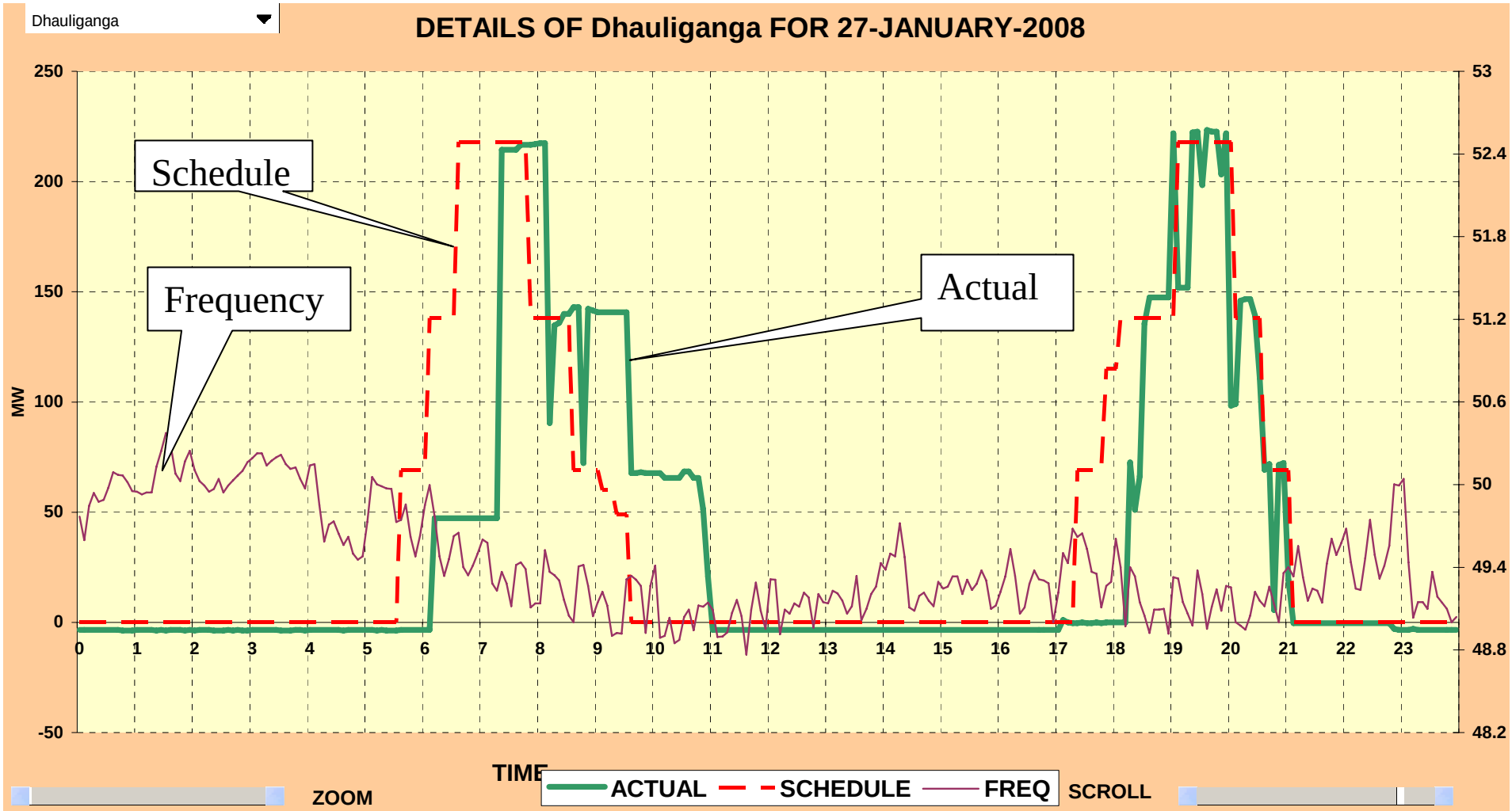
Dhauliganga
DETAILS OF Dhauliganga FOR 27-JANUARY-2008
Schedule
Frequency
Actual
MW
250
200
150
100
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-50
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52.4
51.8
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TIME
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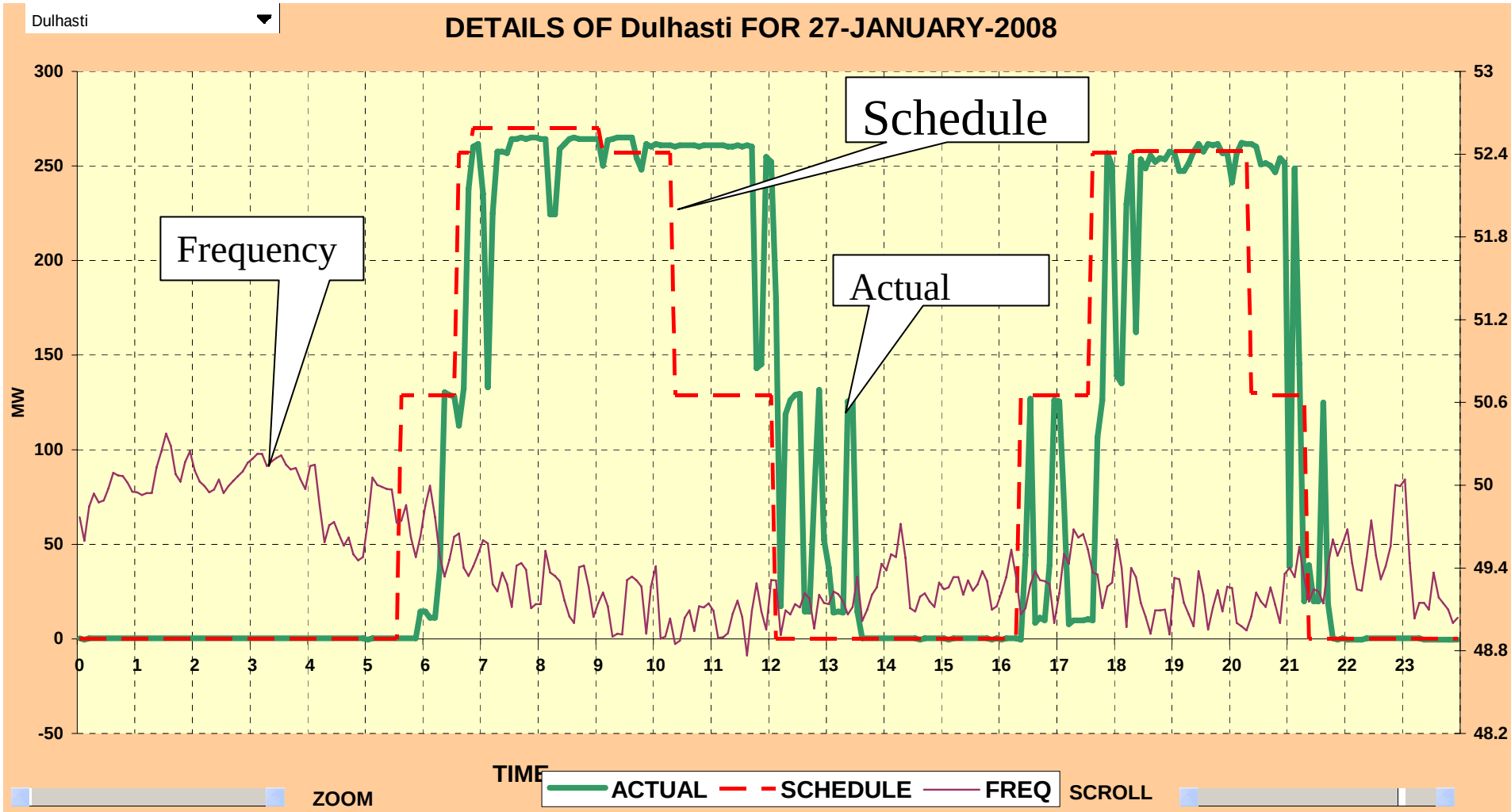
Dulhasti
DETAILS OF Dulhasti FOR 27-JANUARY-2008
Schedule
Frequency
Actual
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300
250
200
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100
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-50
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52.4
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51.2
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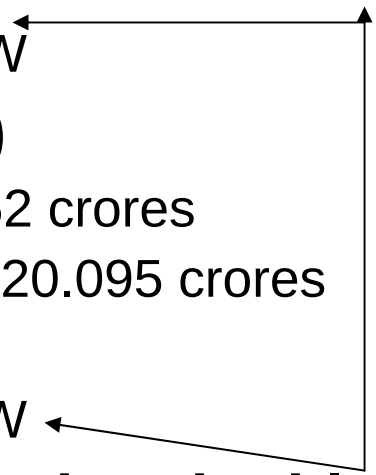
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
TIME
ACTUAL
SCHEDULE
FREQ
ZOOM
SCROLL

Incentive & vintage of plant

Two plants of different vintage attaining 90% availability

- **Singrauli (2000 MW)**
  - AFC for 2008-09: Rs. 350.68 crores
  - Incentive=(5/85)*350.68=Rs. 20.63 crores
  - Additional MW: 100 MW
  - Incentive: Rs. 20.63 lakhs/MW
- **Rihand Stage-I (1000 MW)**
  - AFC for 2008-09: Rs. 341.62 crores
  - Incentive=(5/85)*341.62=Rs. 20.095 crores
  - Additional MW: 50 MW
  - Incentive: Rs. 40.19 lakhs/MW
- **Incentive per extra MW getting doubled merely because of plant vintage**



Existing scheduled plf based incentive

- Singrauli 2007-08
  - **Scheduled plf 91.90%**
  - **Incentive received @25 paise/kWh for 192.84 MU = Rs. 48.21 crores**
  - **Incentive @ 90% scheduled plf= Rs. 47.21 crores**

- **The draft regulations would give different incentive rates for plants based on vintage as well as substantial reduction of incentive amount in many cases**

Power Supply Position 2008-09 (APRIL'08-SEPT.' 08)

Region	Energy(MU) Requirement	Deficit%	Peak Demand(MW)	Deficit%
Northern	112,256	-9.2	34,036	-13.3
Western	121,322	-15.6	37,171	-25.7
Southern	101,753	-7	27,576	-9.2
Eastern	41,664	-5.2	12,210	-6.3
North East	4,940	-15	1,744	-23
All India	**381,935**	**-10.3**	**109,962**	**-15.4**

Energy shortage remains a concern

2007-08--→

Region	Energy(MU) Requirement	Deficit%	Peak Demand(MW)	Deficit%
Northern	217,589	-10.4	32,462	-9.1
Western	247,156	-15.8	38,277	-23.2
Southern	187,736	-3.2	26,777	-9
Eastern	75,772	-5	11,940	-10.4
North East	8,799	-12.3	1,742	-22.7
All India	**737,052**	**-9.8**	**108,866**	**-16.6**

Source: CEA

Effect of capacity charges

of Rs. 18000/MW/day

wef 1st January 2007 on

peaking capability of Tehri