Your EMS system goes down unexpectedly at 11:30. It is not expected back for several hours.

The following attachments show the system information for your Balancing Area.

Use the information provided to answer these questions:

1. What are your operating, spinning, and contingency reserves when the EMS first goes down?
2. How will you manually dispatch your resources for the rest of the day? Explain your reasoning.
3. Do you have enough reserves to make it to the top of each hour?
4. Do you have enough reserves to make it to the end of the day?
5. Will you have enough contingency reserves throughout the day?
6. Fill in the worksheet as you go.
7. We will not be calculating ACE for the end of each thirty minute time frame. Discuss the implication of different ACE values on the load.
8. Discuss the loss of a unit. TLR?

System Information

		rating
unit 1	combined cycle	500MW
unit 2	drum type steam	800MW
unit 3*	super critical steam	800MW
hydro 1	small lake	200MW
hydro 2	huge lake	400MW
4 - 50MW CTs (1 hour notice)		200MW

RS Agreement (ramps in 10 min.s	200MW
non-firm sales thru hour ending 13	100MW
firm purchase	100MW

* Unit 3 control pbms. Stable but slow to move
Hydro 2 schedule can not go below 200MW
due to environmental constraints.

IPP 1	100MW
IPP 2	100MW

Load Profile for the day

hour beginning	Projected	Actuals
11:00	1000	1000
11:30	1200	
12:00	1400	
12:30	1500	
13:00	1600	
13:30	1700	
14:00	1800	
14:30	1850	
15:00	1900	
15:30	1950	
16:00	2000	
16:30	1950	
17:00	1900	
17:30	1850	
18:00	1800	
18:30	1700	
19:00	1600	

Schedule Information

hour ending	11	12	13	14	15	16	17	18	19
Total sched. Interch.	100	100	100	0	-100	-100	-100	-100	-100
hydro 1	0	0	0	100	100	100	100	100	0
hydro 2	200	200	200	300	300	400	400	300	200
ipp 1	0	0	100	100	100	100	100	100	0
ipp 2	100	100	100	100	0	0	0	0	0
net hourly change	-	0	100	300	0	100	0	-100	-300

Positive net hourly change = increase in scheduled resources

worksheets

	11:30 - 12	12-12:30	12:30-13	13-13:30	13:30-14	14-14:30	14:30-15	15-15:30
change in load	200	100	100	100	100	50		
change in scheduled resources	100	0	300	0	0	0		
net generation dispatch needed	100	100	-200	100	100	50		

Increasing load is a positive number

hour beginning		11:30	11:30	12:00	12:00	12:30	12:30	13:00	13:00
	rating	dispatch	reserves	dispatch	reserves	dispatch	reserves	dispatch	reserves
unit 1 ----------	500MW	200	300						
unit 2 ----------	800MW	300	500						
unit 3 ----------	800MW	500	300						
hydro 1 ----------	200MW	0	200						
hydro 2 ----------	400MW	200	200						
CTs ----------	200	0	200						
RSAgreement ----------	200	0	200						
non-firm sales ----------	100	tag running	100						
firm purchase ----------	100	tag running	0						
operating reserves ----------		total	2000						
spinning reserves* ----------			1800						
DCS Reserves** ----------			1400						

* spinning reserves = Operating Reserves - CTs offline (these are the reserves I think will move in 30 minutes)

**DCS reserves = spinning Reserves - unit 3 reserves - nonfirm schedule (these are the reserves I think will move in 15 minutes)

Comments:

1. Usually you can change the hydro schedules. These are quick to load and can be used to meet a DCS. Load your slow movers first.

2. consider bringing on your CTs on minimum. These are also quick to load and can be used to meet a DCS.

3. Remember that hydro is also used for flood control. Drought vs. Flood conditions will alter your dispatch options?

4. Run of the river means different things to different companies. Some consider
only those plants that have no reservoirs and use penstocks to get the water to the
turbines, others consider low volume reservoirs that have no affective storage
as run-of-the-river. What goes in, must come out.

5. Don't forget to add your DCS requirement to the load growth expected for the end of the day
to allow for the total reserves you'll need.

6. If you end up with a positive ACE, then your load estimate was too high. Negative ACE, it was too low.
Trend this and change your daily plan as needed.

7. this same format is great for teaching resource management and system alerts, EEAs, etc…
discuss the dispatch options, opportunities, and pitfalls with your system
throw in some curves: JOUs, Pseudo ties, TLRs, loss of units, real world stuff.
Have your plant folks suddenly inform you that the last 150mW of reserves in
a unit just isn't there.
gas curtailments

8. One more time. Have a check list. This clears your head and gets you moving in the right direction. It doesn't do the thinking for you.

9. Make a sketch of what the ACE is doing. This helps some folks visualize what's going on.