Hydrosystem Storage Needs for Reliability
Presented to TMT
July 18, 2001

I. Storage Target

The Northwest Power Planning Council's May 25 Reliability Analysis was based on a BPA Hydsim study that assumed 26,500 mw-mos of Projected Federal System Storage on September 30, 2001:

	Assumed Federal System Storage (MW-Months)	Loss of Load Probability (LOLP)
	26,500	17%
1500	28,000[1]	12%

The Council also analyzed the effects of greater storage contents on LOLP and found that 28,000 MW-Mo was the point of diminishing returns for how system energy contents influences LOLP. So, in the May 25 analysis, while 28,000 Mw-Mo of storage did not achieve the long-term reliability criterion of no greater than a 5% loss of load probability established in the Federal Agencies' 2001 FCRPS Operations Plan, it was the best the region could achieve with system storage.

NOTE: It should also be mentioned that while an additional 1500 MW-Mo of energy storage was what was needed above and beyond the May 25 "expected-case" projection (for September 30) to get to a total system energy storage contents of 28,000 MW-Mo, there was and is a wide range of future scenarios, and as such, the additional amount of storage needed to get to the 28,000 MW-Mo goal was and is a variable.

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II. Next Step Evaluations

The adequacy of 28,000 mw-mo Federal System Storage is subject to ongoing evaluations due to the following:

- Potential West of Hatwai transmission constraint – The Council's analysis did not address this transmission constraint. Changes in area loads will likely determine the degree of impact the West of Hatwai transmission constraint has on certain federal hydroelectric projects.
- 12% loss of load probability/additional storage – Current analysis by the Council indicates additional storage beyond 28,000 mw-mo would have little benefit towards achieving the 5% LOLP stated in the Operations Plan. However, subsequent internal BPA studies indicate that more storage may, in fact, improve LOLP and warrant further evaluation.
- Change in Market Conditions - The Council's study results included projected installation of large amounts of temporary diesel generation. However, due to lower than expected power prices, much of this additional temporary generation has not materialized.

[1] This storage target translates to a Coordinated System Storage Energy **content** of 22,500 mw-mos from full. The Northwest Power Pool reports the Storage Energy Draft weekly at www.nwpp.org.

III. Ability to Achieve Storage Target

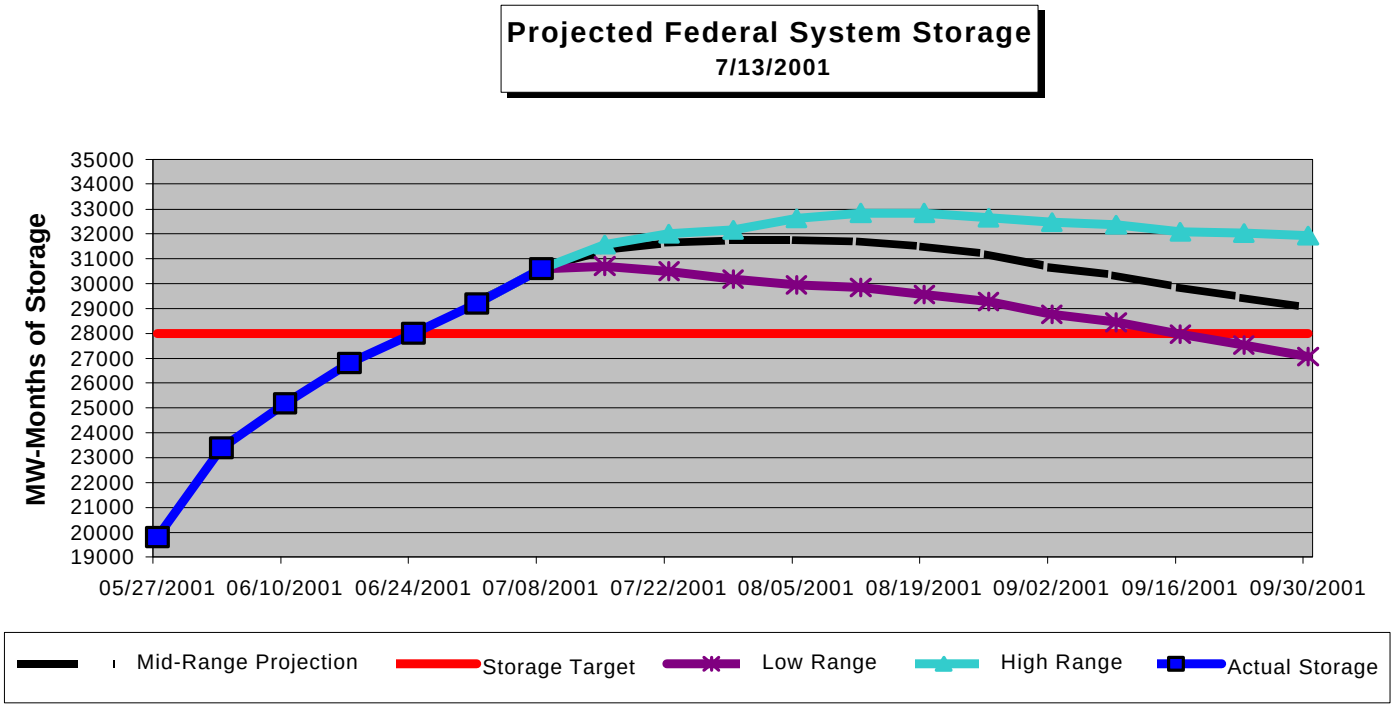
Given historically low water conditions and unknown market conditions, BPA is still concerned about our ability to meet the 28,000 mw-mos target:

A. August/September streamflows

BPA Estimated Natural Runoff at The Dalles in Kcfs

	Aug	Sept	Sum (ksfd)
Record Low (1929 to 1994)	87.2	60.2	4509
May 11 Analysis (Jan-Jul 56.5 Maf)	87.0	64.5	4632
July 5 Analysis (Jan-Jul 57.1 Maf)	74.3	53.0	3893
Difference 7/5 – 5/11	-12.7	-11.5	-739 (-1.5 MAF)

New streamflow estimates have a 1.5 MAF lower volume in August/September. This directly affects our ability to achieve the 28,000 mw-mos storage target.



B. WNP-2 (-500 to -1000 mw-mos)
- 2 week late restart used 500 mw-mo of flexible storage
- continue to monitor project during the critical first 30-day period (early August)

C. Purchase availability for July, August, and September (+/- 500 mw-mos)
- Availability of power on the open market is influenced by thermal resource performance and temperatures in the Northwest and Southwest

D. Load/Temperature variability in July, August, and September (+/- 200 mw-mos)