



California ISO
Your Link to Power

California Independent
System Operator

Summer 2007 Supply and Demand Operational Outlook

Board of Governors Meeting

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Introduction and Overview

- **The CAISO annually prepares a Summer Operational Assessment.**
 - **Incorporates historical load and resource parameters.**
 - **Near-term load and resource changes.**
- **Assessment to highlight:**
 - **Reasonable range of probable operating conditions.**
 - **Probabilities of meeting key operating reserve parameters.**
- **Probability analysis methodology adopted for 2007.**
- **Analysis utilizes CEC probability model using ISO data.**
- **Analysis performed on CAISO control area, SP26 and NP26 sub-regions.**
- **Analysis Focuses on Stage 1, 2 & 3 operating reserve emergency conditions .**



Review of Summer 2006

Demand

- **2006 peak load weather conditions were extremely hot, exceeding both the 1-in-2 and 1-in-10 demand forecast scenarios provided in the Summer 2006 assessment.**
- **The CAISO experienced an all time peak of 50,270 MW, well in excess of the previous 2005 record of 44,311 MW (adjusted) and 2006 most likely forecast of 46,063 MW.**
- **Forecasting models were tested and found to be accurate for temperatures experienced within the normal expected accuracy tolerances.**
- **Forecast model was updated with 2006 temperature and load data resulted in the forecast model being more robust on the high load side.**



Review of Summer 2006 - Continued

Supply

- **Entered 2006 summer with a 24.6% forecasted planning reserve.**
 - **Based on most likely forecasts.**
- **Supply system was tested by record loads.**
- **CAISO managed through the peak without having to shed load.**

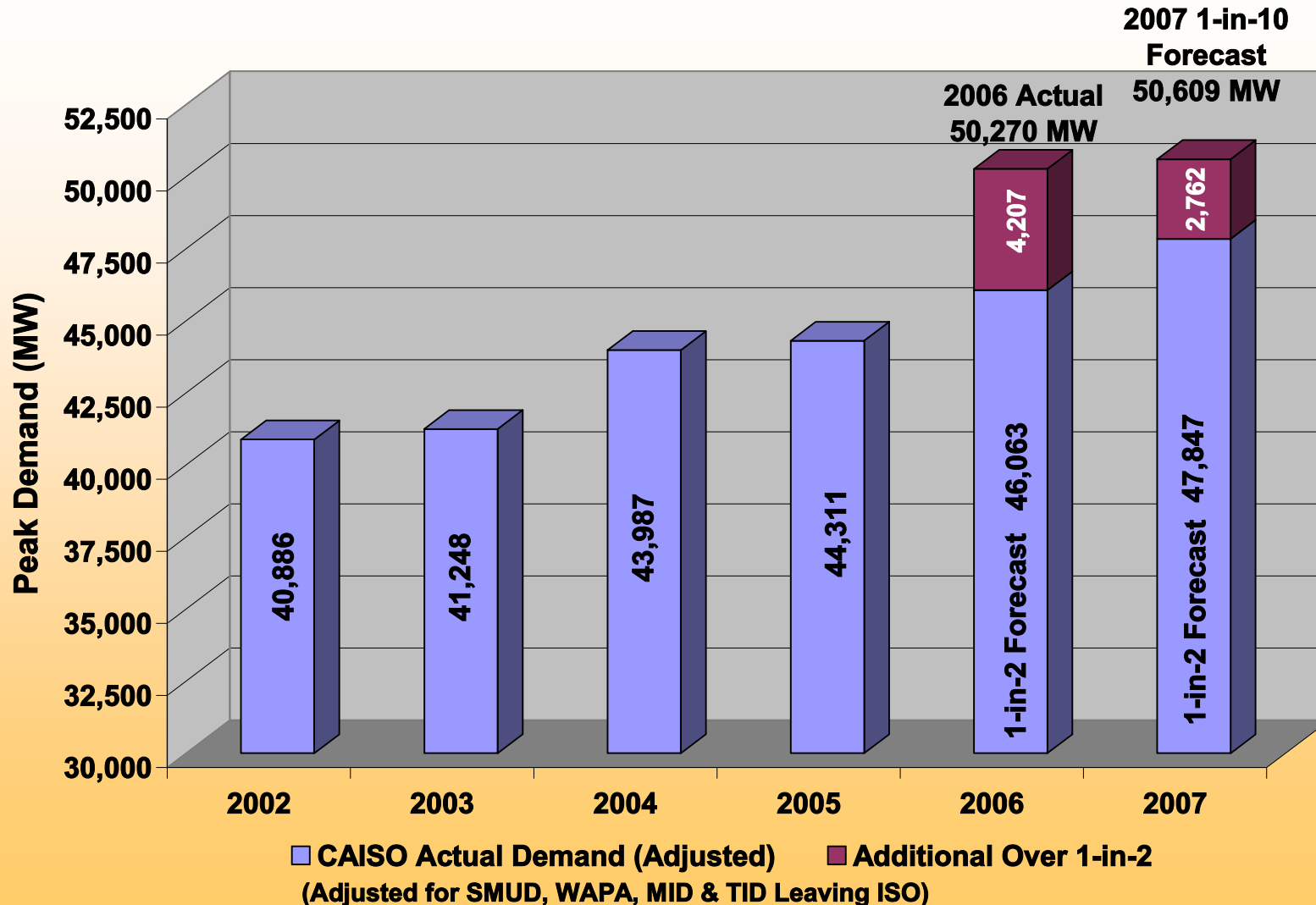
Due to:

- **Superb execution of 2006 Summer preparation plans by all participants**
 - **Generators, transmission owners, conservation campaigns, end-use customers**
- **High Planning Reserve**
- **Resource Adequacy (RA) forward procurement process**
- **Record supply availability**
 - **Generators gave a stellar performance**
 - **Approximately 4,000 MW above historical levels & most likely forecast**
- **Team work between agencies**
 - **Example: Coordination with the Northwest resulted in Imports being approximately 1,000 MW above forecast**



Load Overview

CAISO Historical & Forecast Peak Demand





2007 Resource Overview

Generation

- 2007 control area generation additions are approximately 700 MW.
- California hydro conditions are below normal YTD.

Imports

- System import capability for 2007 is unchanged from 2006.
- Forecast of imports are based on historical trends seen during peak.
- The system has the capability for additional imports.
- Import levels are driven by market need and regional availability.
- Potential increased hydro limitations on Columbia River hydro system are not expected to occur by summer 2007.

Demand Response (DR) and Interruptible Programs

- DR and Interruptible programs are based on CPUC 2007 estimates, adjusted based on historical performance as experienced by the ISO.
- Approximately 230 MW added since summer 2006 (adjusted).
- DR programs are triggered at Stage-1 emergencies (largely voluntary).
- Interruptible programs are triggered at Stage-2 emergencies.

Net 930 MW Impact approximately equivalent to 1-years load growth.



Overview of Probability Analysis

Includes variability due to:

- Annual Peak Load based on historical weather conditions
- Historical range of generation outages at time of peak
- Historical range of transmission limitations at time of peak

Performed for 3 Areas:

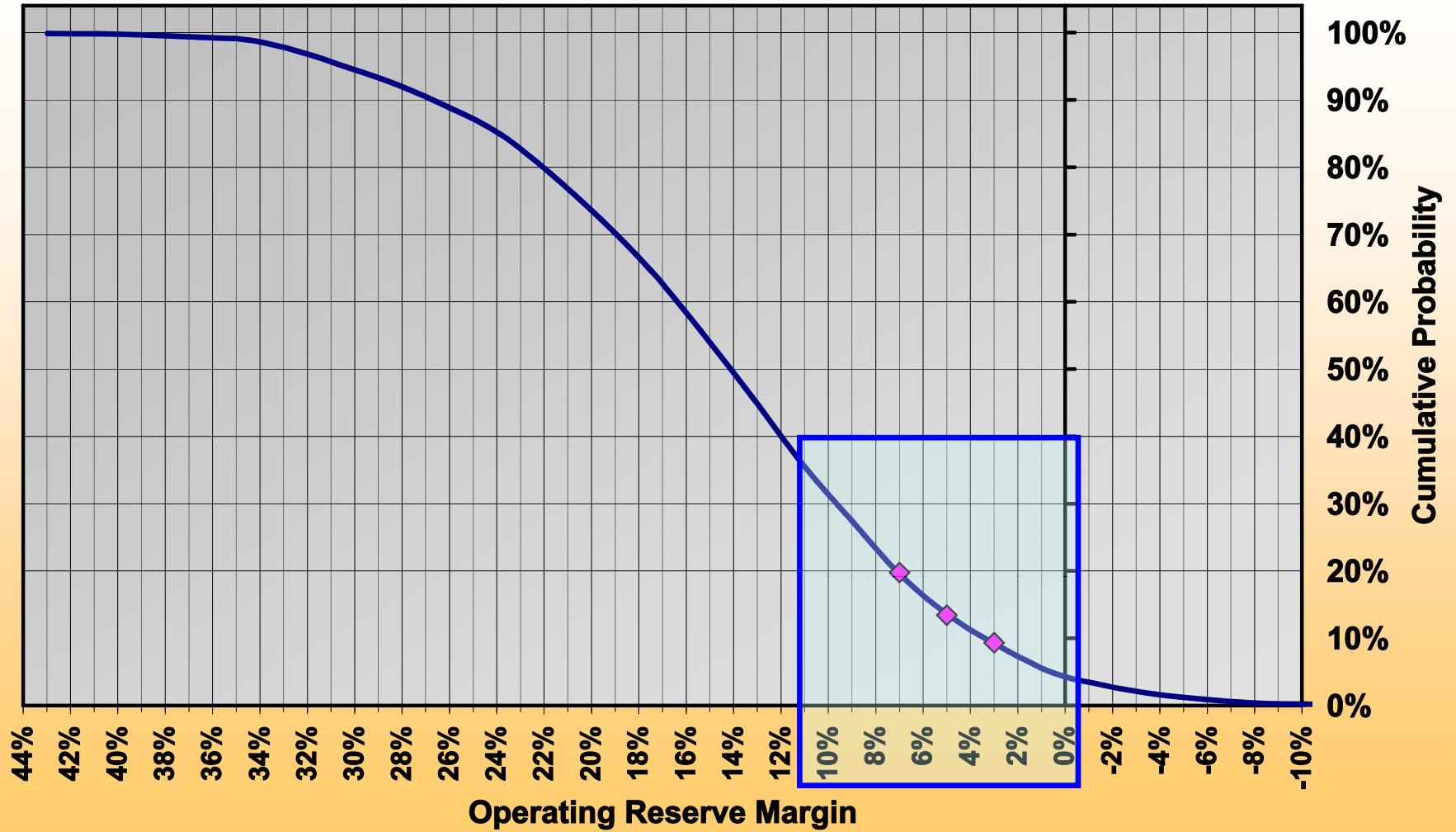
- CAISO control area
- SP26 Zone (South of Path 26)
- NP26 Zone (North of Path 26)

Determines probability of entering into emergency operating conditions:

- Stage-1, Operating reserves below 7%
- Stage-2, Operating reserves below 5%
- Stage-3, Operating reserves below 3%

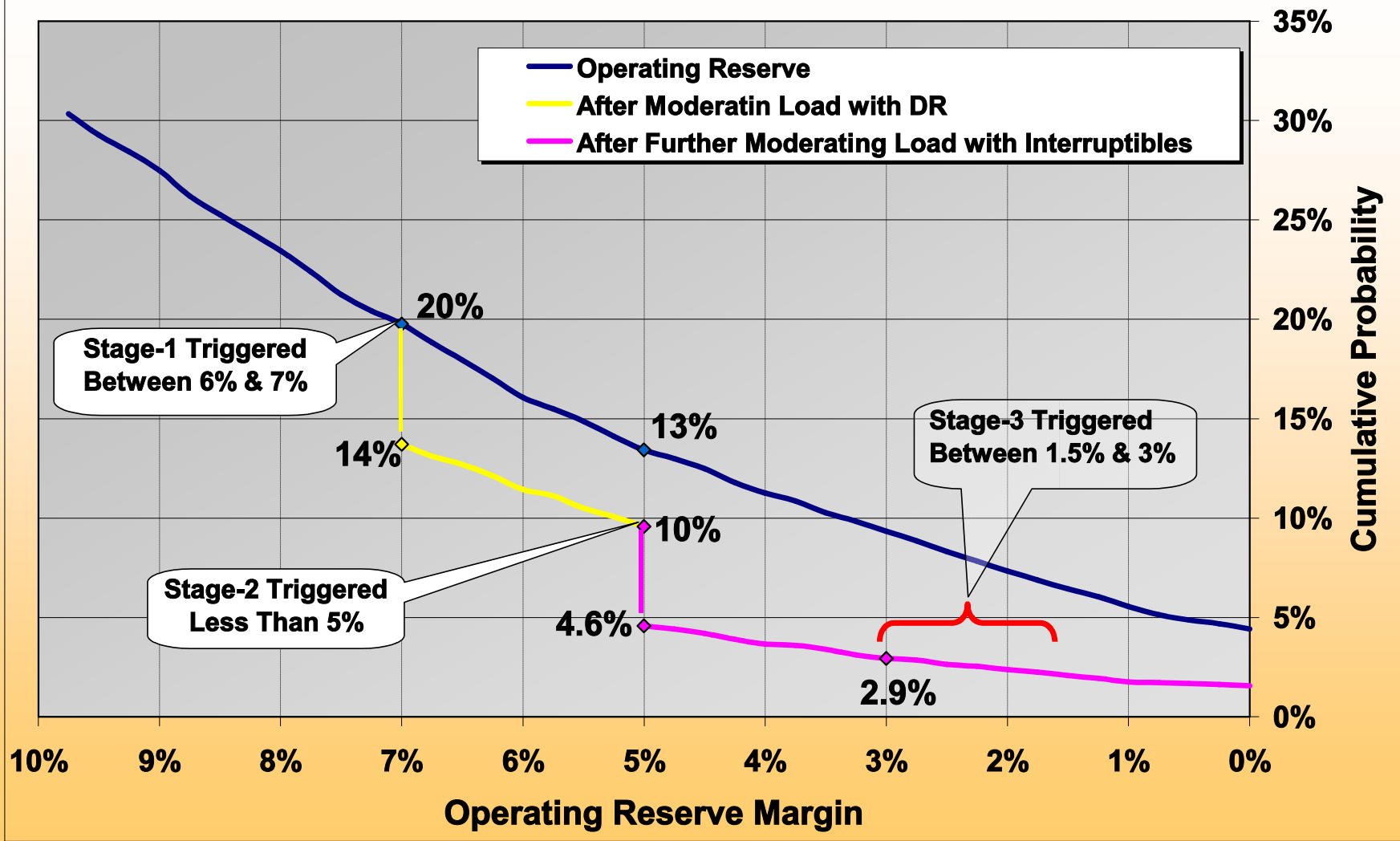


CAISO Summer 2007 Operating Reserves





CAISO Summer 2007 Operating Reserve





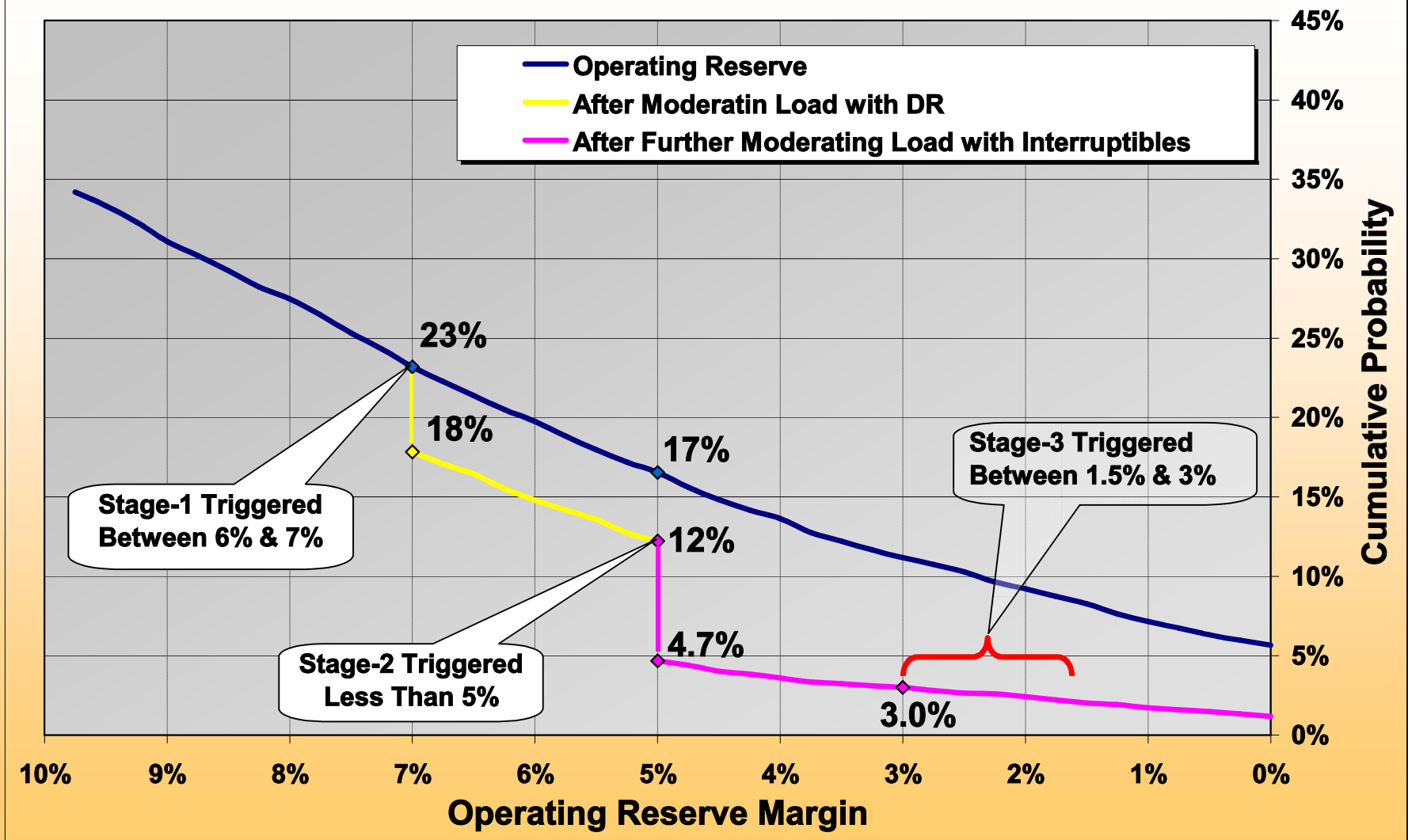
Summer 2007 CAISO Control Area Adverse Scenario Planning

Changes in the actual new generation, DR & Interruptible Programs, either up or down, will change these results.

- **There is a significant probability of entering into a Stage-1 Emergency (20%).**
- **While the probability of conditions occurring that require load shedding is low (2.9%), it is possible scenario.**
- **The CAISO needs to continue to prepare for adverse conditions.**



CAISO SP26 Summer 2007 Operating Reserves





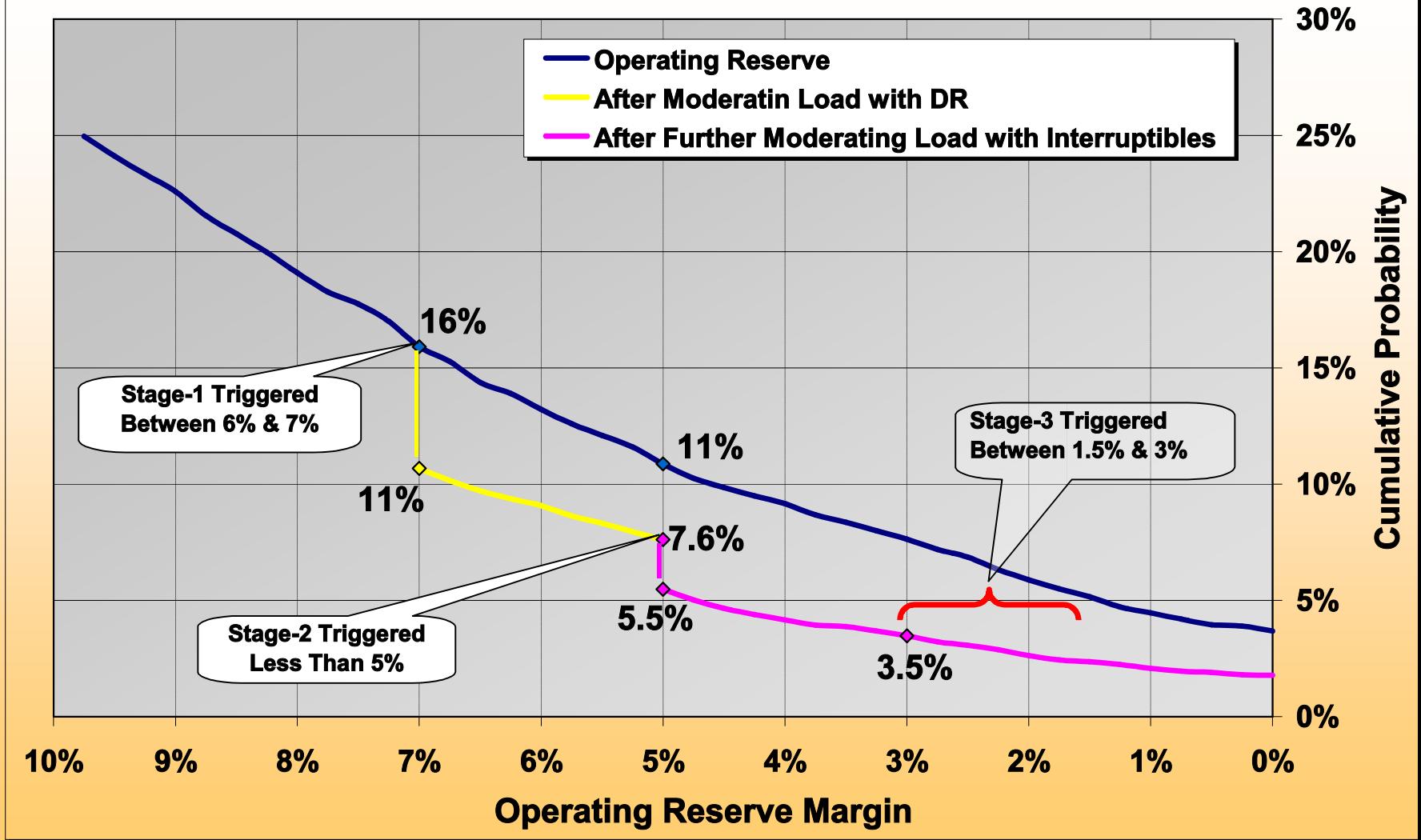
Summer 2007 SP26 Adverse Scenario Planning

Changes in the actual new generation, DR & Interruptible Programs, either up or down, will change these results.

- ✦ **There is a significant probability of entering into a Stage-1 Emergency (23%).**
- ✦ **While the probability of conditions occurring that require load shedding is low (3.0%), it is possible scenario.**
- ✦ **The CAISO needs to continue to prepare for adverse conditions.**



CAISO NP26 Summer 2007 Operating Reserve





Conclusions

- **The amount of risk associated with Summer 2007 operation of the Grid is similar to that of Summer 2006.**
- **The risk of having to shed firm load, is similar in CAISO, SP26 & NP26, and remains a concern under extreme high load and/or adverse supply conditions.**
- **The CAISO is counting on:**
 - **Continued success of the Resource Adequacy programs**
 - **Generation additions**
 - **Continuing increases in DR and interruptible programs**
 - **Summer preparation efforts to manage adverse conditions**
- **Availability of imports and Conservation will continue to be an important factor to help meet demand.**



Summer Preparedness Actions

- **Continue performing engineering studies to identify trouble spots and develop operating tools and procedures to remedy them.**
- **Engage stakeholders concerning reserve margin issues through proceedings such as the Long Term Procurement Process (LTPP).**
- **Coordinate with statewide Flex Your Power NOW! program.**
- **Promote SAVE-A-WATT Voluntary Load Reduction Program.**
- **Complete & quantify transmission upgrades before summer peak.**
- **Meet with utilities, generators and WECC control areas to discuss supply and demand outlook and unit readiness.**
- **Complete summer workshops to prepare ISO and utility dispatchers for summer peak conditions.**
- **Assess utility procurement plans to meet Resource Adequacy requirements.**
- **Participate in WECC and NERC regional demand and supply assessments to determine excess & deficiencies in neighboring control areas.**