

1) How is pumped hydro dispatched?

*Pumped hydro is dispatched according to a schedule established by the generator in advance. Generator owners are permitted to deviate from this schedule with 20 minute notice for adjustment.*

2) Assume a PH unit has 10 hours (full pond level) of run time at full load.

3) If a PH is self-scheduled and schedules less than 10 hours of run time in any day, I'm assuming PJM has the right to dispatch the unit to use the remaining energy in the pond, correct?

*Yes, PJM has the right to dispatch any generating unit that is a capacity resource.*

4) If a PH pumps only half of its energy back into its pond, and then schedules only three hours of run time the next day, the PS could be on the hook for seven additional run hours, correct?

*This depends on the cause for the lack of energy in the pond. If the lack of energy is due to the direction of PJM, then the unit would have to take a forced outage in those additional hours should they be asked to run. That forced outage though would likely be categorized as Outside Management Control. In the case that the lack of energy is due to decisions made by the generating unit (ex. because prices were too high), then the unit would potentially have to take a forced outage but it would not be considered OMC.*

5) Do they receive an RPM penalty for having less than 10 hours of run time in their pond on those days in which they don't have the potential to run for all ten hours?

*No.*

6) Under what conditions would PJM dispatch the remaining energy in a pond?

*PJM would dispatch the remaining energy in a pond for reliability issues, including transmission or capacity constraints.*

7) If a PH self-schedules for 5 hours and has an 'in the money' price or cost for the remaining 5 hours would PJM have the right to dispatch the remaining energy?

*PJM's dispatching of energy is not contingent on whether it is 'in the money'.*

8) Do all PH plants self-schedule?

*No.*

9) If not all PH plants self-schedule, does PJM dispatch PH plants solely on economics? If not what are the other instances?

*PJM will also dispatch for reliability issues, including transmission or capacity constraints.*

10) Are PH plants required to pump to maximum pond level every night or during off peak periods?  
If not, why not?

*No, PJM does not require generating units to maintain maximum fuel capability. That said, PJM can require PH units to pump if a day ahead reliability issue is foreseen.*

11) How is hydro/pumped storage treated by Markets and Operations for providing regulation and energy?

*Treatment of Regulation Service is defined in Manual 11 Section 6.1.2. For Energy, each PH can self-schedule day ahead and then may adjust in real time provided they give PJM adequate notification.*

12) Explain how Market rules and Operations would be affected by the addition of Advanced Storage Resources.

*PJM already has generating units that behave like Advanced Storage Resources. An Advanced Storage Resource would have to be tested for its eligibility in the Regulation Market like any other resource in PJM. There exist no specific rules for Advanced Storage Resources. Manual 11 Section 3 provides an Overview of the PJM Regulation Market, and Section 4 provides an Overview of the PJM Synchronized Reserve Market. Manual 12 Section covers Ancillary Services.*