

ARES NEVADA 50 MW REGULATION ENERGY MANAGEMENT STORAGE SYSTEM

General Description

The ARES Nevada facility, which participates in the California Regulation market, utilizes a single train track loaded with a central queue of heavy shuttle-trains. The electric trains travel up and down a steep grade in response to commands from the California Independent System Operator consuming or producing electricity; balancing electric load with generation. In addition to its high charge / discharge efficiency it is extremely accurate and fast taking only seconds to ramp up to full power.

ARES rail based energy storage systems are covered by one or more of the following US patents: 8593012, 8674541 with foreign patents pending and issued.

Electrical Specifications

Round Trip Efficiency	80%
Substation Power	75 MVA
Substation Transformer H Voltage	230 kV
3 Phase Catenary Voltage	24.9 kV
Facilities Voltage	480,220,110
Maximum Charging Power	56.7 MW
Maximum Discharging Power	44.1 MW
Ancillary Load	0.1 MW
Power Factor of Load (Variable)	±0.95
Starting Current of Load (@25kV)	<10.0 A
Generator Type	DC-Inverter

General Specifications

Location of System	Pahrump NV
Rated Energy Storage	12.5 MWh
Length of Track	5.5 mi
Elevation Differential	2,000 ft
Maximum Grade	8.0%
Average Grade	7.0%
Footprint	43 acre
Total Weight of Trains	9,280 tons

Train Specifications

Number of Trains on Grade	7
Number of Locomotives Per Train	2
Power Per Locomotive (at wheel)	3.9 MW
Unpowered Cars Per Train	7
Average Speed of Trains	18 mph
Method of Power	3φ Catenary
Time - 0 to Full Charge Power	10s
Time - 0 to Full Discharge Power	15s

