

Appalachian Power Facility Upgrades

John E. Amos Power Plant, WV
Mountaineer Power Plant, WV

Stabilize and Optimize Coal Power: Program Portfolio Kick-off Meeting
Oct. 6–7, 2026, NETL Morgantown Campus
Award Number DE-CD0000168



Project Portfolio



The project portfolio will support five facility upgrades in West Virginia, including one at Mountaineer Power Plant and four at John E. Amos Power Plant. The portfolio is estimated to cost \$101.1 million, with 34.2%, up to \$34.6 million, funded through the DOE Coal Grant Program. The upgrades will modernize critical plant equipment, extend asset life, improve reliability and environmental compliance, and reduce operating and maintenance costs, delivering long-term savings and value to customers.

John E. Amos Power Plant

Location Winfield, WV

Nameplate Capacity 2950 MW

Commission Date
Unit 1 (810 MW) Sept 1971
Unit 2 (810 MW) Jun 1972
Unit 3 (1330 MW) Oct 1973

Boiler Technology
Supercritical

Coal Type
Blend of low-sulfur coal and Northern Appalachian Basin high-sulfur coal

Environmental Controls
Electrostatic Precipitator (ESPs)
Selective Catalytic Reduction (SCRs)
Flue-gas Desulfurization (FGDs)



- Unit 1 & Unit 2 Precipitator Hot Roof Replacement
- Unit 3 Cooling Tower Fill Replacement
- Coal Combustion Residuals Reuse Loadout Facility

Mountaineer Power Plant

Location New Haven, WV

Nameplate Capacity 1320 MW

Commission Date
Unit 1 (1300 MW) Sept 1980

Boiler Technology
Supercritical

Coal Type
Bituminous coal

Environmental Controls
Electrostatic Precipitator (ESPs)
Selective Catalytic Reduction (SCRs)
Flue-gas Desulfurization (FGDs)



Pendent Reheater Restoration

Precipitator Hot Roof Replacements

Amos Unit 1 & Unit 2



Technical Summary

An electrostatic precipitator charges fly ash in the flue gas with a high-voltage corona, drives it onto grounded collecting plates, and rappers shed the ash to hoppers — removing over 99% of particulate before gas reaches the stack. Performance depends entirely on holding precise electrode-to-plate geometry and a gas-tight boundary, and the hot roof carries both jobs: it suspends every internal component and seals the casing. Years of high temperature, corrosive gas, and thermal cycling have degraded the Unit 1 and Unit 2 roofs, eroding efficiency and raising the risk of fugitive emissions. Replacement restores the structural and sealing baseline the ESPs need to run at full design voltage.

Why it matters: The ESP is the plant's primary particulate compliance asset under the Clean Air Act and protects the downstream SCR and FGD systems from erosion and fouling.

Current condition: Roof distortion shifts internal alignment, forcing reduced operating voltage; failed seals admit air that disturbs flow distribution and creates acid dew point cold spots.

Scope: Replace deteriorated internal casing and hot roof assemblies with new steel and insulation offering improved thermal insulation, structural integrity, and sealing.

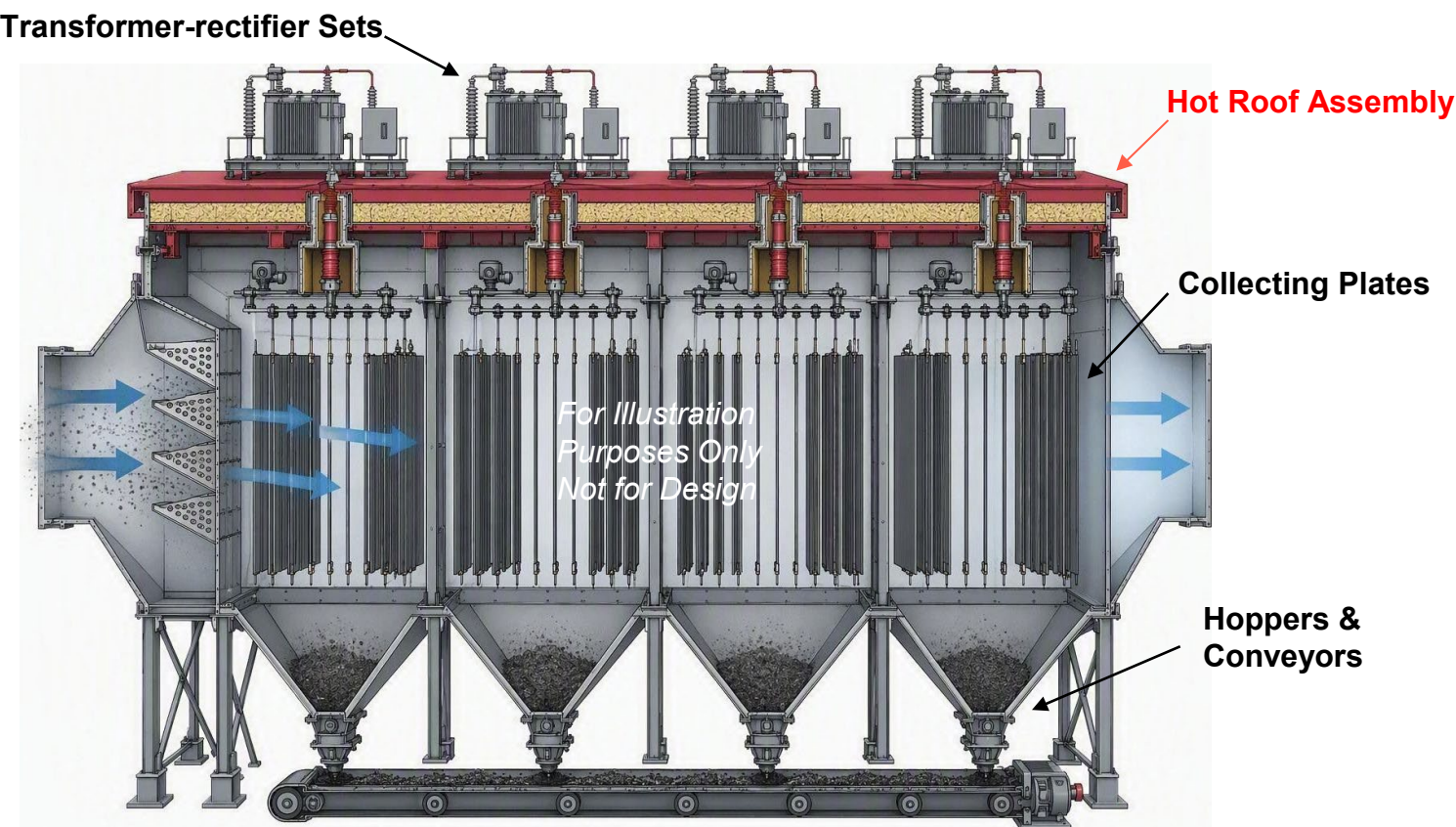
Outcome: Restored collection efficiency, eliminated fugitive emission risk, lower maintenance cost, and extended ESP operational life.

Implementation Approach

The Amos Units 1 and 2 Hot Roof Replacement will be delivered in four phases: engineering and condition assessment, procurement and contracting, outage-aligned installation, and commissioning. Installation covers removal of the deteriorated assemblies and erection of new insulated, sealed roof systems, followed by structural and thermal inspections, leak testing, performance validation, and closeout. Work is targeted for 2027-2028 and is contingent on unit outages of sufficient duration to complete the scope.

Risk Assessment

Project execution risks include potential material delivery and weather-related delays, safety incidents, unforeseen structural conditions during removal, and labor or material cost escalation. These risks will be managed through early procurement, schedule contingency, rigorous safety planning, pre-removal inspections, engineering support, and regular cost tracking.



Cooling Tower Fill Replacement

Amos Unit 3



Technical Summary

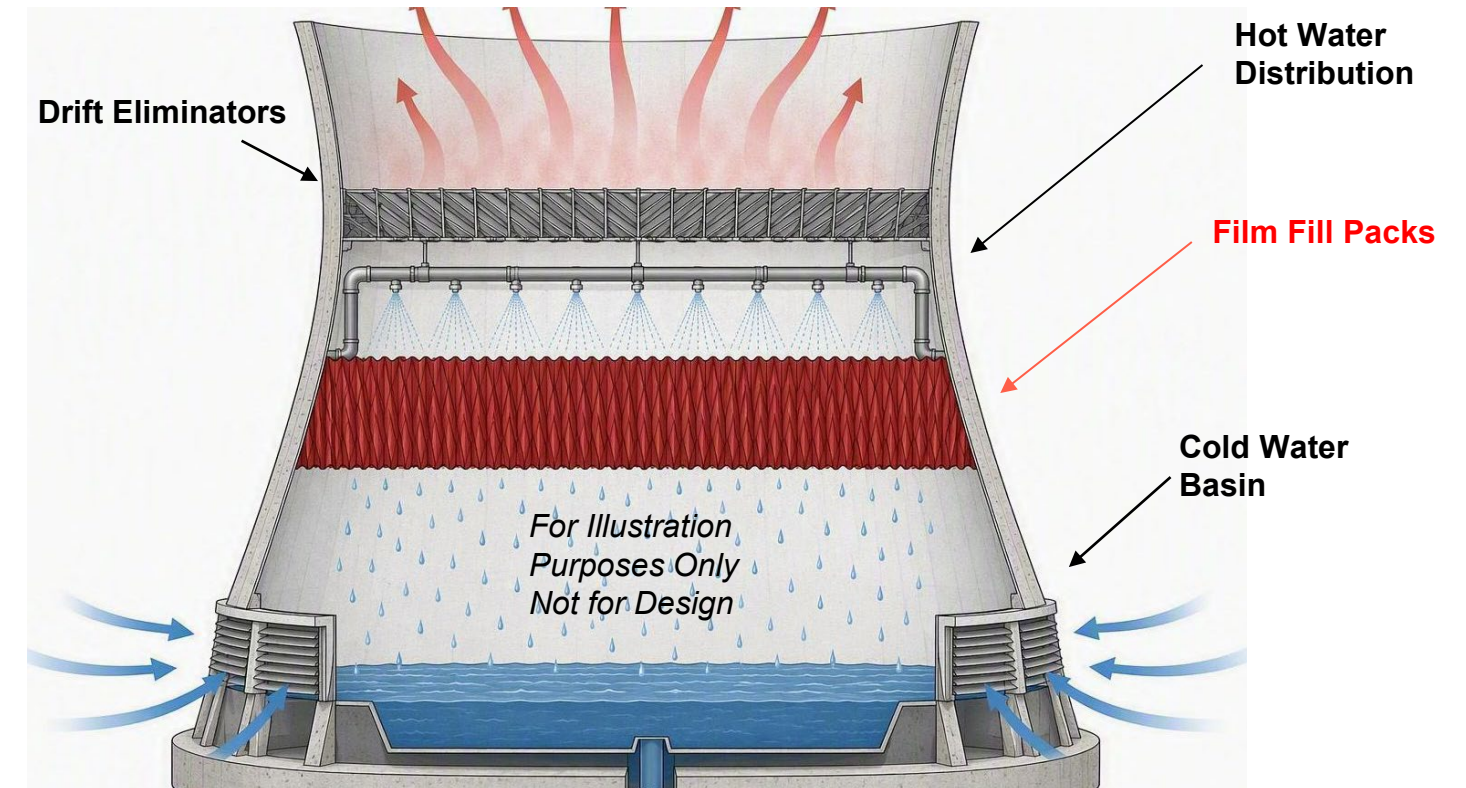
A natural draft cooling tower rejects waste heat by distributing warm condenser water over a bed of film fill, where it spreads into a thin sheet and evaporatively cools against air drawn up through the shell. The fill is the heat transfer surface, so tower performance depends almost entirely on its condition. Years of scaling, fouling, biological growth, and physical degradation have collapsed and plugged sections of the Unit 3 fill, reducing thermal capability, raising cold water and turbine backpressure, and costing unit output on hot days. Replacement restores design cold water temperature and heat rejection capacity.

Why it matters: Cooling tower performance directly sets condenser vacuum and turbine backpressure, making fill condition a driver of Unit 3 heat rate, capacity, and summer generation.

Current condition: Fouled and collapsed fill packs restrict airflow and water distribution, elevating cold water temperature, increasing backpressure, and adding debris load to the basin.

Scope: Remove degraded fill packs and replace with modern high-efficiency film fill, including supporting structure, distribution nozzle, and drift eliminator restoration.

Outcome: Restored cold water temperature and heat rejection, improved heat rate and summer capacity, lower maintenance cost, and extended tower service life.



Implementation Approach

The Amos Unit 3 Cooling Tower Fill Replacement will be delivered in four phases: engineering and fill condition assessment, procurement and contracting, outage-aligned installation, and commissioning. Installation covers removal and disposal of the degraded fill and support structure, installation of new high-efficiency film fill with restored distribution and drift eliminators, basin cleaning, structural inspection, and thermal performance testing at closeout. Work is targeted for 2027-2028 and is contingent on unit outages of sufficient duration to complete the scope.

Risk Assessment

Project execution risks include fill delivery lead times, weather and confined space constraints inside the tower, safety incidents during elevated work, unforeseen degradation of the fill support structure discovered at removal, and labor or material cost escalation. These risks will be managed through early procurement, schedule contingency, rigorous safety and rigging planning, pre-removal structural inspections, engineering support, and regular cost tracking.

CCR Reuse Loadout Facility

Amos Plant



Technical Summary

Coal combustion residuals are a marketable product when they can be moved to market at scale, and river transport is the lowest-cost path to the regional wallboard and cement market. The reuse loadout facility creates that path: haul trucks transfer gypsum material from the landfill to a receiving trough near the river, where it is dumped into a conveyor that carries it to a barge loader for direct loading into moored barges. The project converts a disposal liability into a revenue-generating product stream while consolidating dust control at a single transfer point.

Why it matters: Barge loadout unlocks bulk-volume beneficial reuse, reducing CCR landfill volume and long-term closure liability under the federal CCR Rule while creating a revenue stream from a material the plant already produces.

Current condition: There is no river loadout capability today, so marketable volume is capped by truck haul economics and available disposal capacity continues to be consumed.

Scope: Construct a truck-to-barge loadout facility including the landfill haul route and truck dump receiving trough, a conveyor to the river, a barge loading tower with telescoping chute and dust control.

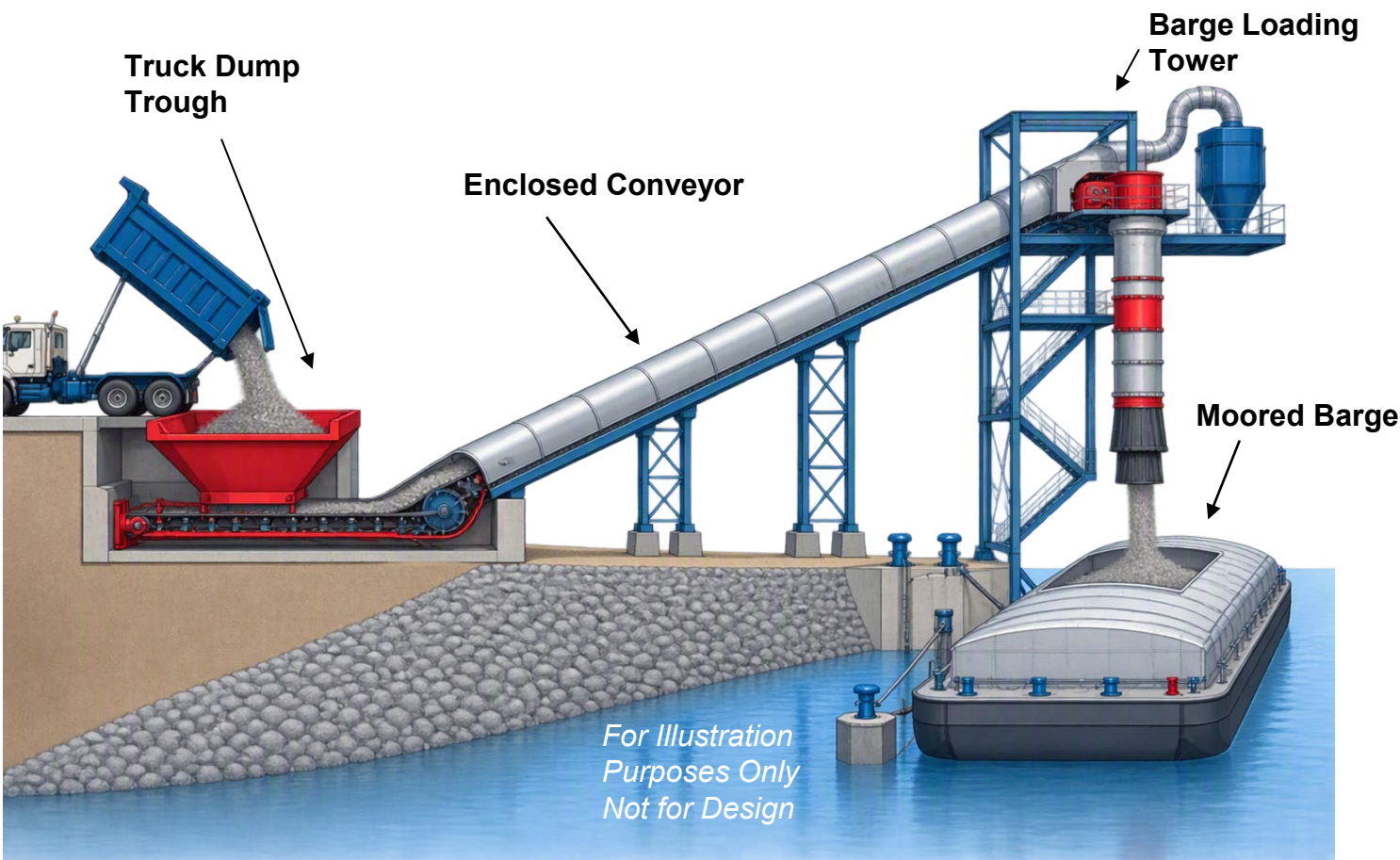
Outcome: Increased beneficial reuse volume at barge scale, reduced landfill disposal and closure liability, lower transport cost, and a new material revenue stream.

Implementation Approach

The Amos CCR Reuse Loadout Facility will be delivered in four phases: siting, permitting, and detailed design; procurement and contracting of the conveyor and barge loading systems; civil construction and equipment erection; and commissioning. Construction covers the haul route and truck dump trough, conveyor foundations, barge loader and chute erection, followed by functional testing, operator training, and closeout. Work is targeted for 2027-2028 and can largely proceed without unit outages.

Risk Assessment

Project execution risks include waterway and shoreline permitting timelines with the Corps of Engineers and state agencies, long lead times on conveyor and barge loader equipment, haul route traffic interface with plant and landfill operations, and variability in gypsum market demand and barge availability. These risks will be managed through early regulatory engagement, advance procurement, haul logistics planning, and offtake and barge service agreements.



Pendent Reheater Restoration

Mountaineer Unit 1



Technical Summary

The pendent reheater is the tube bank suspended in the upper furnace ductwork that returns steam from the high-pressure turbine exhaust back to near main steam temperature before it enters the intermediate pressure turbine. Reheat temperature is a direct lever on unit heat rate, so the condition of these assemblies governs both efficiency and availability. The Mountaineer pendent element surface area had been reduced prior to a fuel switch in 2006 which reduced the reheat outlet design basis temperature. Restoration to the original configuration will return the reheater to the original design temperature and reliable service.

Why it matters: Reheat outlet temperature is a direct driver of unit heat rate, so operating below the original design basis costs fuel, capacity, and emissions performance on every megawatt-hour produced.

Current condition: Reheater heating surface area removed to accommodate attemperator limitations left the unit operating at a reduced reheat outlet temperature, with heat absorption below the boiler's original design configuration.

Scope: Reinstall pendent reheater surface area to the original design configuration, including new tube elements, headers and hanger attachments, tube supports and spacers, and roof seal and casing restoration as required.

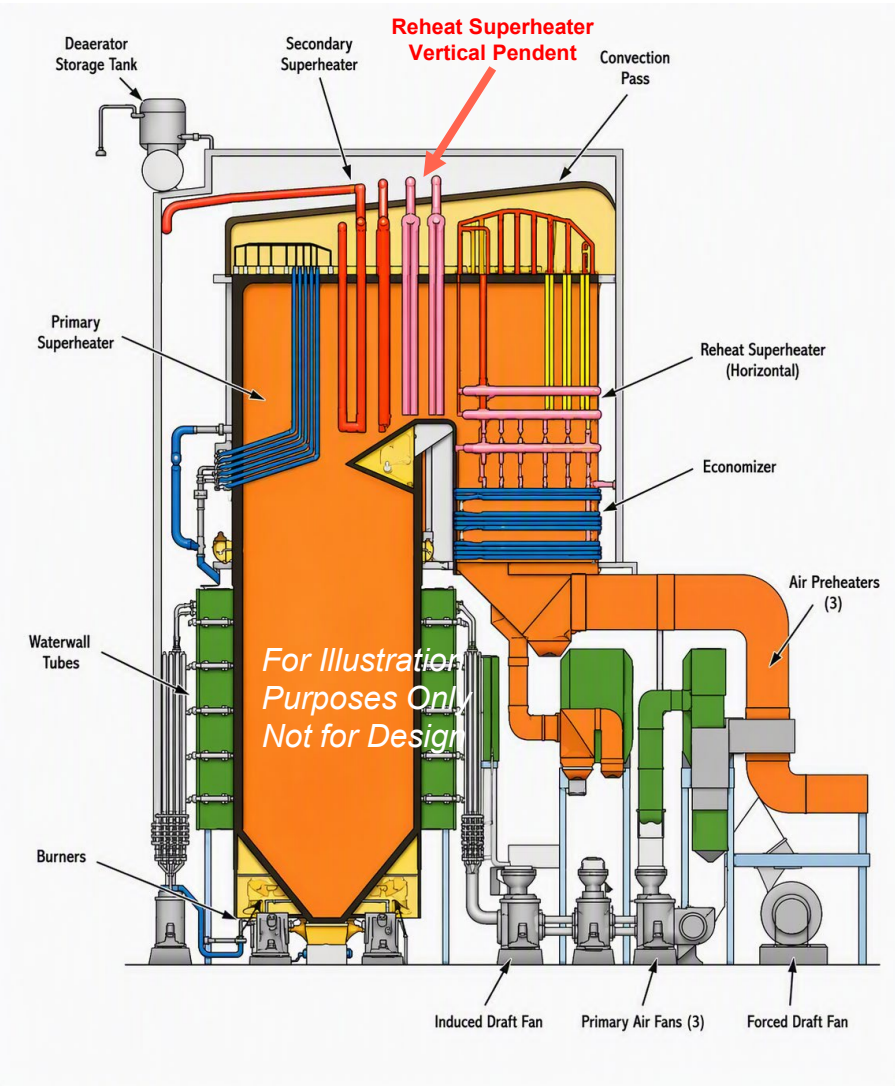
Outcome: Reheat outlet temperature returned to original design basis, improved unit heat rate and fuel efficiency, lower emissions per megawatt-hour, and boiler performance realigned with its design configuration.

Implementation Approach

The Mountaineer Pendent Reheater Restoration will be delivered in four phases: engineering and thermal modeling to confirm the surface area required to reach the original reheat outlet temperature; pressure part procurement and contracting of boilermaker resources; outage execution; and return to service. Execution covers scaffolding and access, installation of the reinstated pendent elements, headers, supports, and spacers with welding and post-weld heat treatment, inspection, and hydrostatic testing. Work is targeted for 2027 and is contingent on a unit outage of sufficient duration.

Risk Assessment

Project execution risks include long lead times on pressure part tubing and bends, availability of qualified boilermaker and welding resources during outage season, weld quality and post-weld heat treatment rework, elevated and confined space safety exposure, and outage schedule compression. These risks will be managed through OEM engineering review, advance material procurement, early contractor engagement and craft planning, rigorous weld quality control, detailed safety and access planning, and outage schedule contingency.



Thank You

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