THE AUSTIN ADVANTAGE

BREAKING BARRIERS UNDERGROUND WITH 72,600 TONNES BLASTED FROM THE SURFACE

GENERAL **INFORMATION**

Location: Nyrstar Immel Mine, East Tennessee

Industry: Underground Zinc Mining

Products Used: E*STAR electronic detonators (1,350 units), E*STAR CUBE centralized blasting system, Pumpable emulsion explosives (uphole), SHOCK*STAR MS detonators (downhole sequencing)

Project Lead & Author: Jim Winfield*, Underground Mining and Explosives Engineer

THE **HISTORY**

Austin Powder's partnership with Nyrstar began in 2020 at its Mid Tennessee operations, where Nyrstar specifically requested E*STAR electronic detonators to gain improved timing accuracy and flexibility for large stope blasts. Early success with E*STAR electronic initiation and Austin Powder's reliability in uphole emulsion delivery established trust and operational credibility.

Between 2020 and 2024, the relationship expanded into East Tennessee operations, supported by ongoing customer training, pumpable emulsion innovation, and increasing blast scale. By 2024–2025, this six-year collaboration matured into the deployment of the E*STAR CUBE centralized blasting system, positioning both companies to achieve a historic surface-initiated underground blast.

THE **GOALS**

1. Improve underground blasting safety by eliminating personnel exposure at the blast face
2. Deliver precision timing and verification for large stope blasts
3. Enable remote, surface-initiated blasting through centralized control
4. Scale electronic initiation to support very large blasts (1,350+ detonators)
5. Provide a complete digital audit trail to support operational control and regulatory compliance

CUSTOMER **CHALLENGE**

Nyrstar faced the challenge of safely firing large underground stope blasts while minimizing personnel exposure and improving control, consistency, and documentation. As blast sizes increased into the hundreds, and then thousands, of detonators, Nyrstar needed a solution that could verify every detonator, reduce misfire risk, integrate with existing mine IT infrastructure, and support regulatory and internal reporting requirements, all without compromising production efficiency.

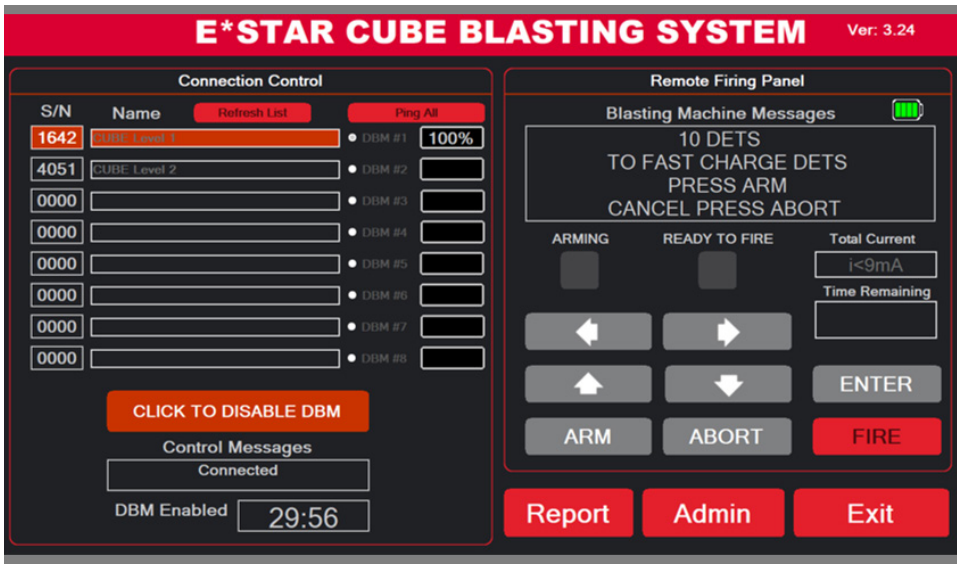
THE **AUSTIN** SOLUTION

Austin Powder implemented the E*STAR CUBE centralized blasting system, supported by E*STAR electronic detonators and pumpable emulsion, using a disciplined, phased approach led by the Austin Powder technical team.

Key elements of the solution included:

- Integration of the CUBE system directly into Nyrstar's mine LAN using a dedicated VLAN (VLAN 207)
- Methodical testing with dummy detonators before live production
- Full electronic verification of every detonator prior to firing
- Remote, surface-based initiation via Ethernet-connected laptop
- Precision timing with ±1 millisecond accuracy, far exceeding traditional fuse-cap variability

The approach culminated in a surface-initiated blast with zero personnel underground, supported by a complete digital EthReport audit trail.



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THE **OUTCOME**

Austin Powder and Nyrstar executed a historic blast at the Immel Mine:

- 1,350 E*STAR detonators verified and successfully fired
- 72,600+ tonnes blasted from Stope 25-77-W
- 722 drilled holes totaling 25,698.8 feet
- 100% detonator verification rate prior to firing
- Zero personnel underground during blast initiation

Beyond the scale, the blast delivered meaningful operational benefits: improved safety, reduced misfire risk, precise fragmentation control, and a complete digital record of every detonator and firing event. The success demonstrated that the E*STAR CUBE system can reliably scale to extremely large blasts while advancing mine safety, automation, and centralized control—setting a new benchmark for underground blasting operations.

**Jim Winfield is a Technical Representative for Austin Powder Company, Midsouth LLC, and Underground Mining and Explosives Engineer. He holds a B.S. in Mining and Minerals Engineering from Virginia Tech and has led underground blasting and optimization programs throughout his career.*

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