



T-MAN LIGHTING TOWER

SHINING A LIGHT ON SAFETY

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THIESS

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Understanding and leading in times of true adversity

BACKGROUND

At any given time up to 60 separate 240V lighting plants can be operational on an active mine site. Each lighting tower required constant manual handling, physical interaction with heavy and light vehicles, monitoring and maintenance.



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PROBLEM

- » 240V lighting towers expose staff to electrical circuits
- » Require 240V electricians for maintenance
- » Require constant:
 - » manual handling
 - » monitoring
 - » maintenance
 - » mobilisation/demobilisation
 - » refuelling
 - » in person start up and switch off
 - » limited light dispersal.



HAZARDS

» Electrocution	Possible Fatality
» Interaction with light and heavy vehicles /accidents	Possible Fatality
» Handling broken glass bulbs – lacerations	Minor - Serious Injury
» Exposure to harmful gases (mercury, metal halides)	Minor – Serious Injury
» Manual handling – musculoskeletal disorders (MSDs)	Minor – Serious Injury

SOLUTION

- » Substitute 240V for 24V
- » Decrease bulb replacement
- » Match or increase lighting output
- » Reduce plant engine size, fuel consumption, servicing and refuelling frequency
- » Recycle old lighting plant frames, axles, wheels and hydraulics
- » Satellite monitoring.

Collaboration Partners

- » **HAYNES Group** - provided workshop facilities, components and materials
- » **Auxilium Systems** - provided components and satellite tracking software.



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SATELLITE MONITORING SYSTEM

Mobile Plant Management (MPM) by Auxilium is available on both mobile application and PC.

Light tower functions monitored by MPM:

- » Remote engine start
- » Remote engine stop
- » Location
- » Engine hours
- » KM travelled
- » Towing speed
- » Fuel levels
- » Carbon foot print.

Subscribed alerts:

- » Engine maintenance schedule.



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240V METAL HALIDE 6 HEADER LIGHT TOWER

VS

24V LED 6 HEADER LIGHT TOWER

ALLIGHT 240V METAL HALIDE 6
HEADER (6000W) LIGHT TOWER –
LAKE VERMONT, CENTRAL QLD
3_9_2015



THIESS 24V DC LED 6 HEADER LIGHT TOWER
(6 X DOMNATOR 4000 - 120,000 EFFECTIVE
LUMENS) – LAKE VERMONT, CENTRAL QLD
3_9_2015



Dual Axle Lighting Tower



BEFORE.

- 3 OR 4 CYLINDER ENGINE - 3.50 TO 4.00 LITRES PER HR (DEPENDENT ON NUMBER OF LIGHTS)
- 250 HOUR SERVICE INTERVAL
- REFUEL EVERY 76 HOURS (W. EXISTING FUEL TANK)
- 240V AC GENERATOR REQUIRING HV SAFETY CERTIFICATE TO OPERATE
- METAL HALIDE LIGHT FIXTURE W. BULB & REQUIRING ELECTRICAL BALLAST
- METAL HALIDE LIGHT REQUIRES START UP PERIOD - NO INSTANT ON/OFF
- BULB & BALLAST REGULARLY FAIL IN NORMAL OPERATION



SATELLITE MONITORING SYSTEM:
RUN TIME, FUEL LEVEL, FUEL
CONSUMPTION, ENGINE ALERTS,
LOCATION, REMOTE START/STOP



NEW CONTROL PANEL
W. HYDRAULIC & ENGINE
CONTROL SWITCHING



TWIN CYLINDER 24V DC
200A GENERATOR



420 LITRE FUEL TANK, NEW
400 HOUR RUN TIME -
ORIGINAL RUN TIME 76
HOURS

AFTER.

- 2 CYLINDER ENGINE - 1 LITRE PER HR
- UP TO 400 HOUR SERVICE INTERVAL
- REFUEL EVERY 400 HOURS (SAME AS SERVICE INTERVAL)
- INBUILT ENGINE PROTECTION SYSTEM (OIL, TEMP UNDER & OVER VOLTAGE)
- 24V DC GENERATOR - NO HV SAFETY CERTIFICATE REQUIRED
- LED LIGHT FIXTURE - INSTANT ON/OFF, NO PARTS TO REPLACE, 5 YEAR WARRANTY
- NEW LIGHT OUTPUT EXCEEDS ORIGINAL LIGHT TOWER



OPERATIONAL BENEFITS

- » **Increased light output** by 51,600K per dual axle tower
- » **Increased engine life** 20,000hrs
- » **Increased lamp life** to 50,000hrs
- » **Reduced engine and trailer weight** - increased mobility
- » **Reduced refuelling frequency** from every 3 days to once a month
- » **Reduced annual carbon emission saving** 26,600 CO2kg per dual axle
- » **Reduced manufacturing costs** – recycling old parts

Long-term financial benefits were achieved from reduced fuel consumption, part replacements and maintenance.

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REDUCED HAZARDS

- » 240V electrical circuits down to 24V
- » Heavy and light vehicle interaction
- » Exposure to harmful gases (mercury, metal halides)
- » Manual handling – musculoskeletal disorders (MSDs)
- » Lacerations - handling broken glass bulbs

Substituted

Reduced

Reduced

Reduced

Reduced

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COST BENEFITS

- » Outlay per dual axle tower \$17,745
- » Annual savings per dual axle tower \$34,824
- » Total outlay (160 T-MAN towers) \$2,718,880
- » Total annual savings (160 towers) \$5,399,040



TRANSFERABILITY

The whole innovation or individual elements can be transferred across the industry.

Satellite Monitoring System (MPM by Auxilium)

- » Vehicle and maintenance monitoring for trucks on site
- » Minimise heavy and light vehicle interaction
- » Monitoring other ancillary equipment
- » Monitor breakdowns
- » Monitor shutdowns for maintenance
- » Monitor ramp traffic and vehicle routes.

240V to 24V generator conversion

- » Concept applied for air conditioners and other small motors
- » Old lighting plant can be converted/recycled – increased asset lifespan.

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The **T-MAN Lighting Tower Refurbishment Program** has **exceeded all expectations** delivered **increased safety** by reducing interaction with live plant, and **minimised manual handling hazards**. The program has also **increased productivity and reduced running costs**.

- » Over 160 Thiess owned T-MAN lighting towers have successfully been converted across Thiess' Australian operations
- » Thiess is currently exploring opportunities to apply this technology across its global operations.

T-MAN – Thiess manufactured

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QUESTIONS?



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