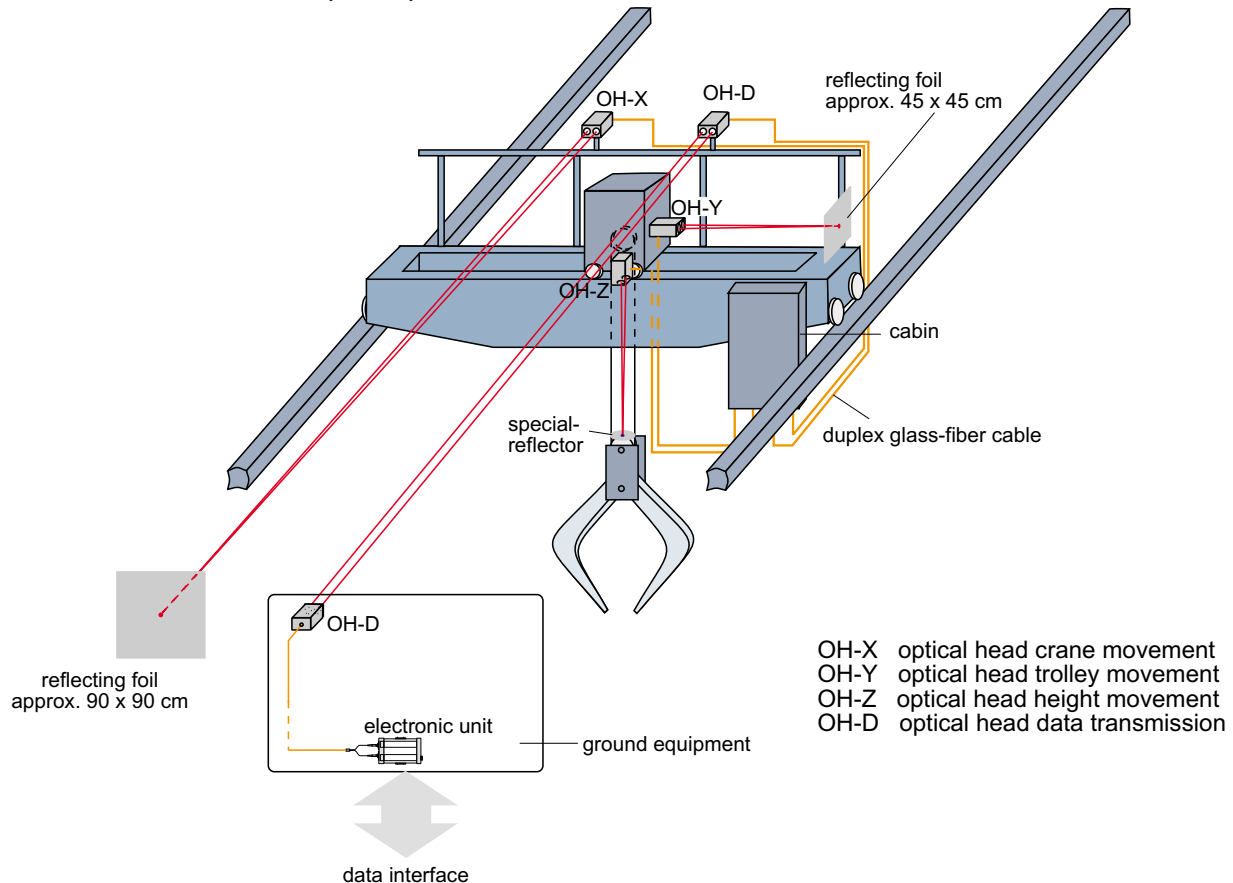


Applications of **RIEGL** Laser Instruments

Problem: Automatic crane positioning

Solution: Optical range measurement in three axes with three LD90-3100HS-GF instruments with fiber-coupled optical heads, and a DL90-600 for data transmission.



Advantages:

- ✓ No electronics contained in the optical heads
- ✓ Extremely lightweight and inexpensive optical heads
- ✓ Installation of electronic units in protected area
- ✓ Easy and cost-effective replacement of parts of the system in case of servicing requirements

Performance:

- ✗ Maximum range up to 600 m
- ✗ Accuracy typically 20 mm
- ✗ Free line-of-sight required

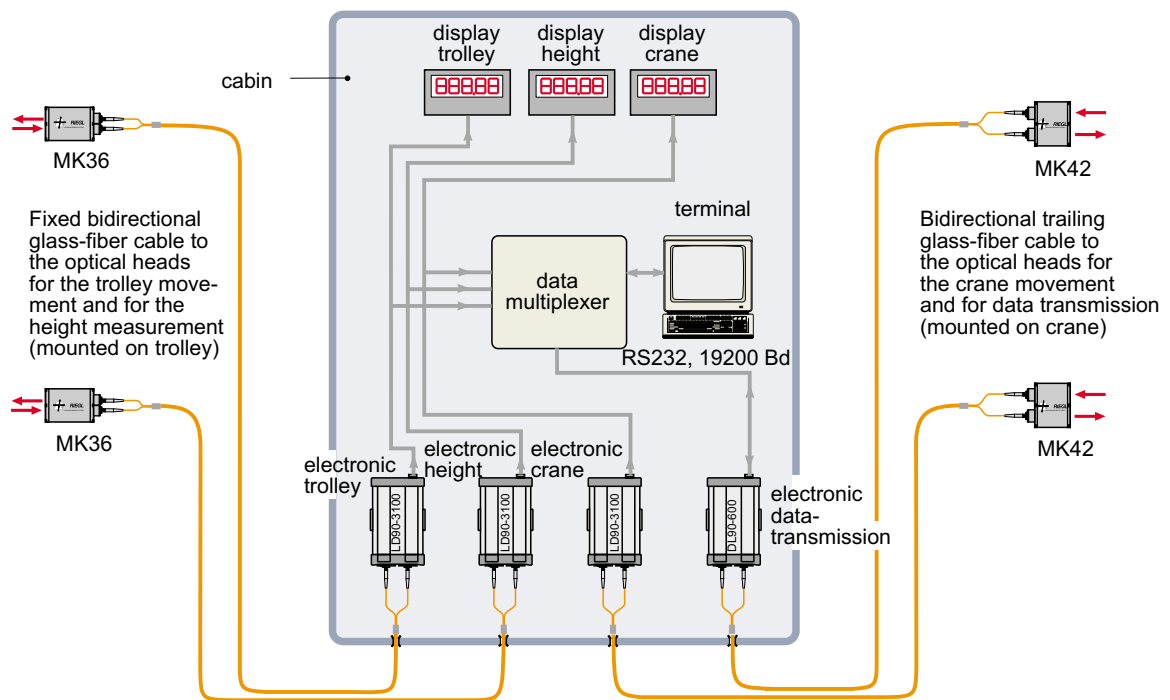
Related applications:

- ☞ Crane collision avoidance
- ☞ Optical data transfer

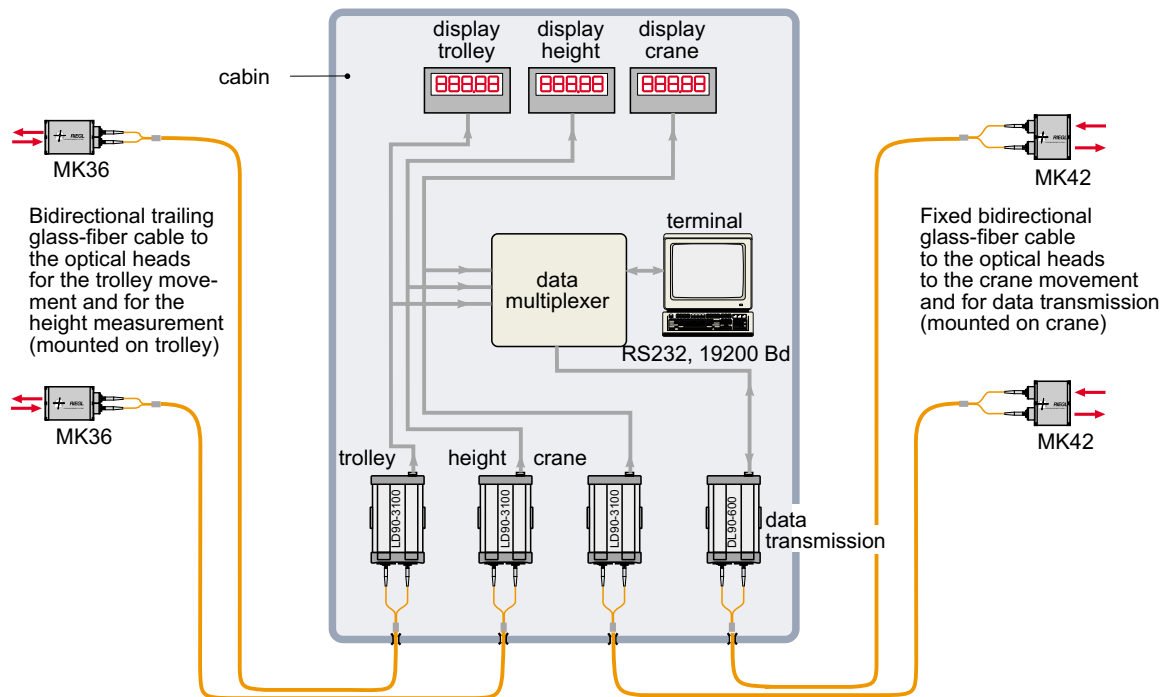
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Applications of **RIEGL** Laser Instruments

Arrangement of electronic unit with cabin fixed to trolley



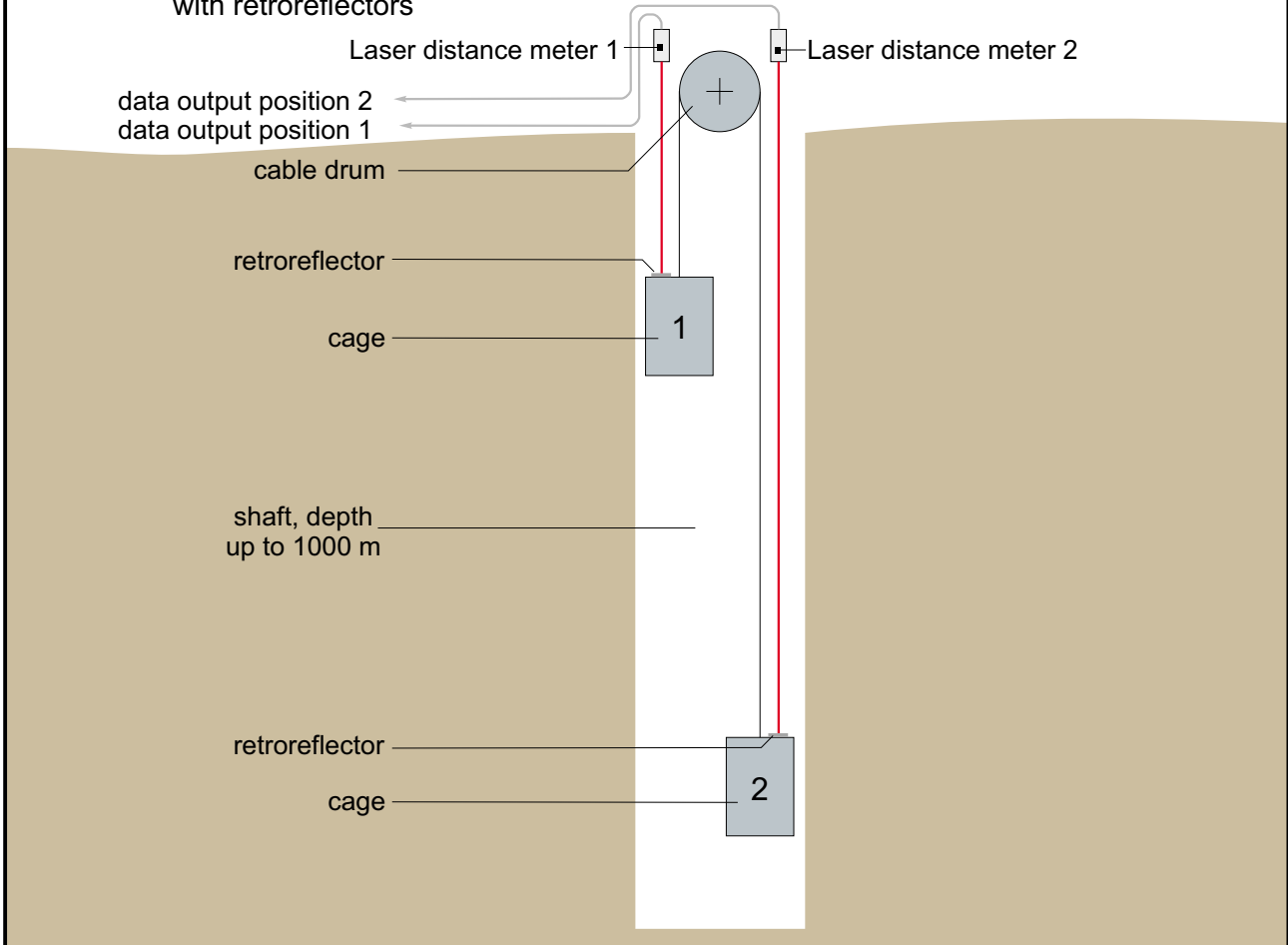
Alternative arrangement of electronic unit with cabin fixed to trolley



Applications of **RIEGL** Laser Instruments

Problem: Measurement of the exact position of cages in a shaft in mines

Solution: Laser distance meter LD90-3100HS measures downwards to the cages equipped with retroreflectors



Key features:

- ✓ Fulfilment of safety requirements
- ✓ Automatic cage position control
- ✓ High reliability
- ✓ Explosion proof

Performance:

- ✗ Range up to 1000 m
- ✗ Accuracy up to a few cm

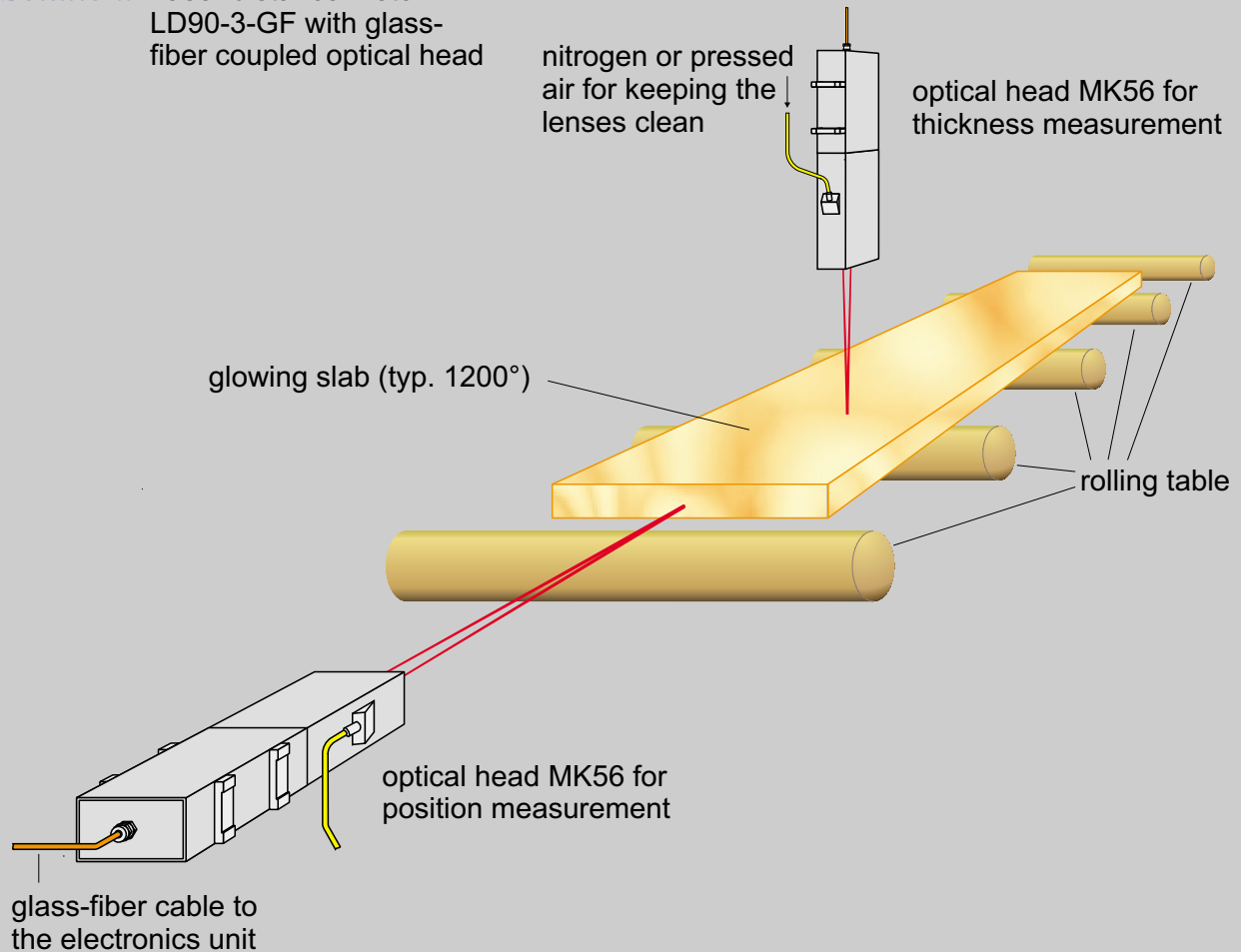
Alternative approach:

- LD90-3100-GF with glass-fiber coupled optical head

Applications of **RIEGL** Laser Instruments

Problem: Contactless automatic measurement of the position or of the thickness of glowing slabs in a rolling mill

Solution: Laser distance meter LD90-3-GF with glass-fiber coupled optical head



Advantages:

- ✓ Use of optical head only allows simple installation, cooling and - in case of accident - of replacement
- ✓ Glass-fiber cable connection to the electronics allows its comfortable mounting in a protected room

Performance:

- ✗ LD90-3100HT-GF for position measurement: range up to > 50 m, accuracy typ. 15 mm
- ✗ LD90-310HT-GF for thickness measurement: range up to 10 m, accuracy typ. 10 mm

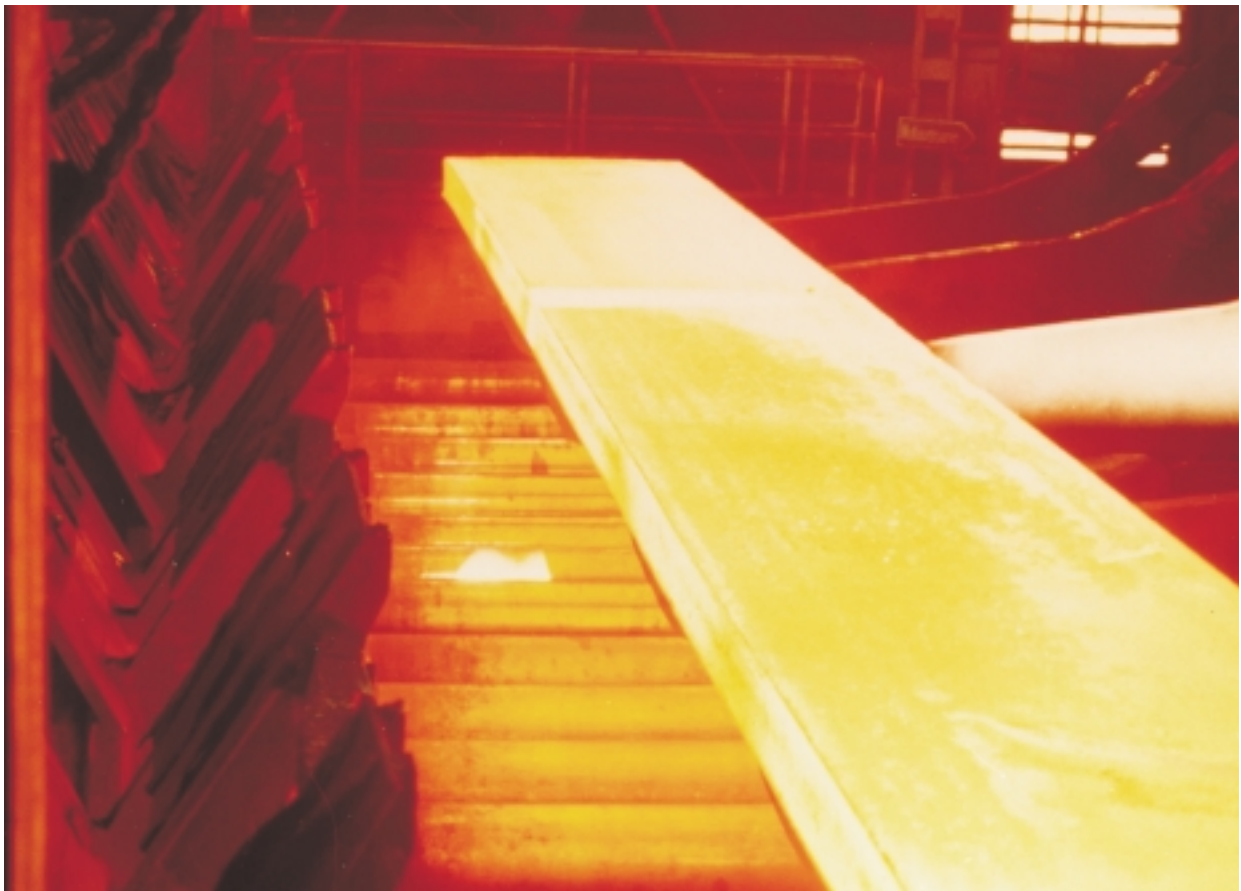
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Applications of **RIEGL** Laser Instruments

Laser distance meter
LD90-2 (earlier version)
with protection tube



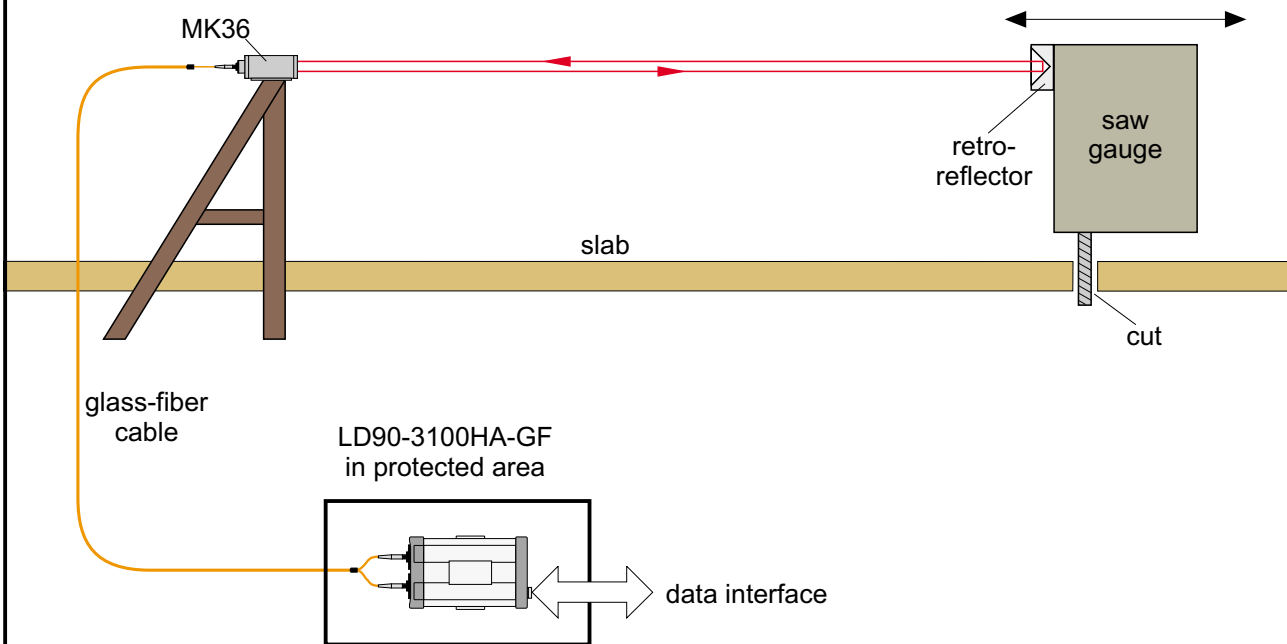
Glowing slab on a rolling mill, positioned by LD90-2 laser distance meter



Applications of **RIEGL** Laser Instruments

Problem: Position Saw Gauge to accurately cut of steel slab.

Solution: More accurate cuts results in significant reductions in steel waste. The **LD90-3100HA-GF** replaced mechanical stops which tended to move resulting in slabs being cut too long. Often the final piece was too short and had to be scrapped entirely.



Advantages:

- ✓ Quick return on investment
- ✓ Remote optical head needs no cooling in 60 °C (degrees centigrade) environment
- ✓ Accessible
- ✓ Easy installation

Performance:

- ✗ Measuring range - >100 meters with reflector
- ✗ Accuracy - 1 cm absolute, 1 mm resolution

Accessories:

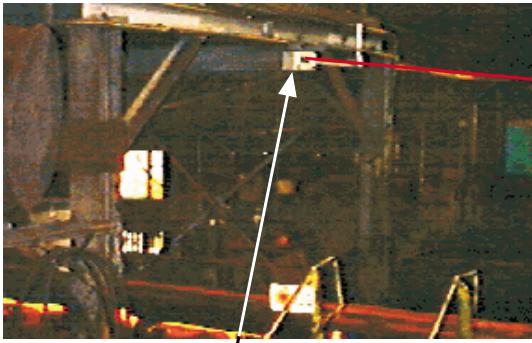
- ☞ Red semi-conductor laser places red dot on target for alignment.
- ☞ Operator display and/or feedback to host computer for process automation.

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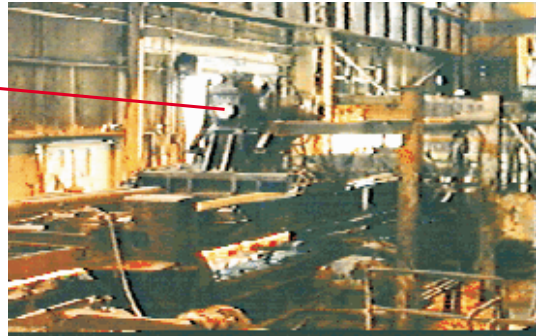
Applications of **RIEGL** Laser Instruments

During normal mill operation with 5 saw gauge the laser shall be active for positioning the gauge, the beam will be active and during these operations there shall be no reason that personnel would be in the path of the beam due to hot steel on the table rolls. The laser will be controlled by finishing end PLC and the beam shall be turned off automatically whenever there is no product being run to 5 saw. The beam will also be automatically turned off during non-production turns.

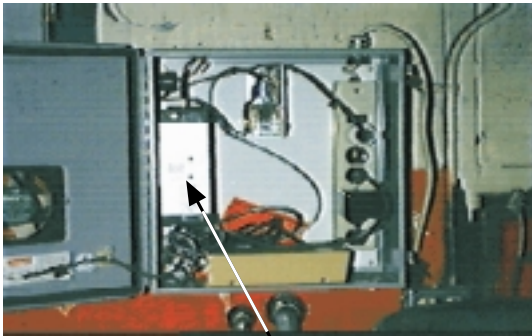
The laser unit proper which is mounted on an hoffman enclosure inside 5 saw pulpit shall be padlocked and only authorized Mtce personnel shall have access to the unit. the only mtce procedures would be to check the alignment and clean the lense, in this case mtce personnel shall folow established lock-out procedures when servicing the unit.



Remote sending & reflecting lens, mounted under 5 saw pulpit, elevation 9 feet above table rolls.



Beam is transmitted to 8 in. stainless target mounted on 5 saw gauge, elevation 9' above rolls.



Laser unit mounted in hoffman enclosure inside 5 saw pulpit. Signals sent to remote lens via fiber optic cable. Cabinet will be padlocked.



Laser warning signs @ south east corner of 5 saw.