The "Broken" Gantry Crane

George was worried. For almost two years he had been working in the design office on the addition of two 130MW propeller turbine-generator units at an overseas 340MW power plant, where four 85MW Kaplan units had been operating for 14 years. The installation was simple, since the intakes, penstocks, and empty bays in the powerhouse were in place, having been built during the initial construction work. Also, empty bays for the new equipment lay beside the repair bay, unusually located in the middle of the powerplant, eliminating the need to transport materials across operating units.

However, there was one problem. The new units were nearing completion. In a few weeks, workers would need to use a large 100 ton gantry crane to install new trashracks. But, the crane didn't work. Fred, the new resident engineer, had ordered checks of the power supply, cables, fuses, and all connections – to no avail. All reports from the operators said, "All OK. No electricity."

George thought back to his initial visit to the plant about 30 months ago. He had inspected the gantry, and all seemed fine. Although the crane lay idle for the past 12 years, operators had painted and maintained it. And they had sealed gaps in the locked cable reel box to keep out the local rats. (Vermin had destroyed a 24-

wheel rail transporter used to bring heavy loads to the plant during the 14 years it sat at a rail siding. They especially liked chewing on electrical insulation and hydraulic hoses.)

What did George know about gantry cranes?

George thought back to his days as an undergraduate engineering student. On his first summer job, he was apprenticed to a harbor engineer. George's first task was to obtain data on the harbor gantry cranes after a fire destroyed all engineering records. The engineer had also asked him to look into the rope greasing records for one of the cranes, since the wire rope required replacement due to rusting every two years. Ropes on all the other cranes needed replacement at only five- to eight-year intervals.

George measured the pulley wheel diameter at the top of the jib, as well as the diameter and number of outside strands on all the ropes. The harbor engineer wondered whether the wheel diameter on the suspect crane was too small for the rope. He wanted to compare it to the other cranes, since rope and wheel replacement had been somewhat haphazard.

As George carried out his work, he asked the crane operators how they greased the wire rope. All but one operator performed this monthly task at by dropping the hook onto the wharf, tying it to a bollard, and slowly unwinding the cable. They then painted the cable with grease as they spooled it back onto the

drum. The one exception was the operator for the crane in question. He simply lowered the hook into the salty dockside water and greased the cable on winding back! Despite the fact that one crane performed differently from the others, no one had asked the crane operator how he maintained the cable.

Remembering this experience, George called Fred.

“Have you ever spoken to the crane operator?” he asked.

The answer was no. All communication had come through the plant manager and chief operator. George then asked Fred to accompany the crane operator up onto the intake deck first thing in the morning and ask him to start the gantry crane. [Fred replied he would do so, but he did not expect success. The crane simply would not start.

On arriving at the office next day, George received a short message that to his surprise read, “Gantry working – don’t ask how.” George planned to find out when he returned to the plant in a few months for commissioning.

Next year, George waited until the new units were commissioned,then he asked Fred about the gantry.

“You won’t believe it,” Fred said. “After months of inquiries and investigations, it was just a matter of connecting to the right power outlet.”

When Fred and the crane operator reached the gantry that morning, the operator unlocked the cable reel cabinet, and dragged the heavy power cable to the

power outlet between units 2 and 3. Fred helped him, but they came up short. The fully extended cable was 2 meters shy of the outlet. Fred just shook his head and helped the operator drag the cable in the opposite direction to another power outlet between one of the new units and the repair bay. They reached the outlet with cable to spare.

Fred admitted that, for a moment, he had trouble finding the outlet. A brass plaque installed on the dam during the dedication service 14 years earlier concealed it. As for the crane operator, he was new and had never used the gantry crane. When he asked plant operators where the power outlet was, everyone referred him to the outlet used during installation of the first four units.

Lesson Learned.

When faced with a puzzling situation, investigate the case firsthand. Don't rely on intermediaries. Often the solution is quite simple.

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