MEXICO: LAGUNA VERDE PROJECT

PROJECT	EQUIPMENT	WEIGHT
POWER	LIFTING SYSTEM / STRAND JACKS	327 TON

Fagioli Inc. was awarded the heavy activities relating to the Upgrade of the Nuclear Plant in Laguna Verde, Veracruz, Mexico, performing the replacement of two Old stators with two new units. Laguna Verde Nuclear Power Plant (LVNPP) is located on the coast of the Gulf of Mexico, in Alto Lucero, Veracruz, Mexico and It is the largest electric power generating nuclear plant in Mexico producing about 4.5% of the country's electrical energy. The replacement operation increases the current installed capacity of the plant by 20%, from 1,350 to 1,634 MegaWatt. There were many problems to overcome in order to perform the replacement operations. First of all the notable weight of the items to be replaced (720,000 lbs each) ; the restricted working areas within the premises; the low capacity overhead crane which was the only existing
lifting means inside the turbine hall. Moreover there was no time available for ‘dry run’ or testing the fitting of the system before the Outage (shut down of the plant). Last but not least, working in a living nuclear plant with all of the health and safety matters involved for all the personnel involved in the operations. Fagioli’s engineering division came up with an innovative interesting and successful solution idea in order to complete the operation without the necessity for any civil interventions within the operative living plant. The project engineering preparations started one year and a half before the job actually began.

Due to the low capacity of the hook on the overhead crane, Fagioli designed a Lifting System consisting of two L300 Strand Jacks which was conceived to fit between the existing beams of the overhead crane, the system was designed by Fagioli and finalized with feedback on the admissible loads received from the overhead crane manufacturer in December 2009.
The Lifting System by itself weighed almost 133,000 lb. built with Steel type A992 Grade 50 to reduce the pressure on the system with a reinforcement of the supports under the rails. The system consisted of a swivel connected to the anchors of the strand jacks. The 2 x 300 tons strand jacks were positioned on the jack support beam while the jack support beam sat on each end on a “u” shaped structure. The 882,000 lb. capacity swivel (able to rotate the stator) , rollers and girders were all supported by the beams of the existing overhead crane. The structure was suspended from the traverse top beams and at both ends the roller beams sit on the overhead crane girders, precisely on the trolley tracks.
The Fagioli designed system had never been assembled on the overhead crane prior to the performing of the actual lifting operation. When the installation work of the system started inside the building, 24hour continuous operations were requested by the customer due to the fact that the outage on each unit was confined to only 45 days during which all of the related activities for the setting of the new Generation lane had to be completed.
REPLACEMENT WORK TOOK PLACE DURING NUCLEAR POWER PLANT OUTAGE.
Safety matters was extremely important for several reasons:
-Working at height in radioactive environment
-ALARA which is the acronym of “ As Low As Reasonably Achievable” which means making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical, consistent with the purpose for which the licensed activity is undertaken
-Radiation protective clothing for personnel working on the overhead crane
-Strict working shifts for our personnel with continues and regular tests for radiation
- Temperature in the working area at the overhead crane under the turbine roof in excess of 105 degrees Fahrenheit
- Strict schedule to maintain 84 continuous hours without breaks were required in order to complete all related operations for the installation of the new generator The job was safely performed without interruption and without injuries.
A total of almost 18,000 working hours for this job.
The Project was completed on schedule and on budget