Pulse™ Case Study: Partnership for Manufacturing Excellence

Harper International

Spark the future.™

"Harper is very innovative. They have provided excellent, intuitive service, looking ahead into the future as to what we might need."

Timothy A. Dye
Engineering Manager
Toho Tenax America

"The Harper Pulse™ group's outstanding performance on our recent HT Furnace upgrade and rebuild was key to a successful project that will deliver savings for our company's bottom line. Across our many experiences with Harper, we have seen that they share our vision for safety and quality of work, along with an urgency to get production systems back in operation. With their strong technical and operational support, we completed the project ahead of schedule, below budget, and reduced the total downtime for this equipment, ultimately delivering significant savings in capital expenses and an increase in revenue through additional uptime of the production line."

Simon C. Harvey
Operations Manager
Cytec Carbon Fibers

Pulse™ Enlightened Service

Company Profile

One of Harper's clients is a leading supplier of uranium and manufacturer of uranium fuel bundles. Globally, they support CANDU nuclear energy plants through supply of their uranium products to generate clean, safe and reliable energy. They have a license to produce approximately 1,200 tons of uranium annually as finished fuel. Their primary objective is to sustain a safe, reliable and competitively positioned operation, while delivering a high quality product to key customers.

Objective

Our client and Harper established a support program focused on operational reliability through the following short term and long term goals:

Short Term Objectives

- Rebuild two production lines
- Assess strategic parts inventory
- Tailor training program for site personnel
- Qualify three new production line installations

Long Term Objectives

- Continue projected rebuild schedule
- Implement strategic parts program
- Data analysis for predictive maintenance
- Document best practices for ongoing training

Condition

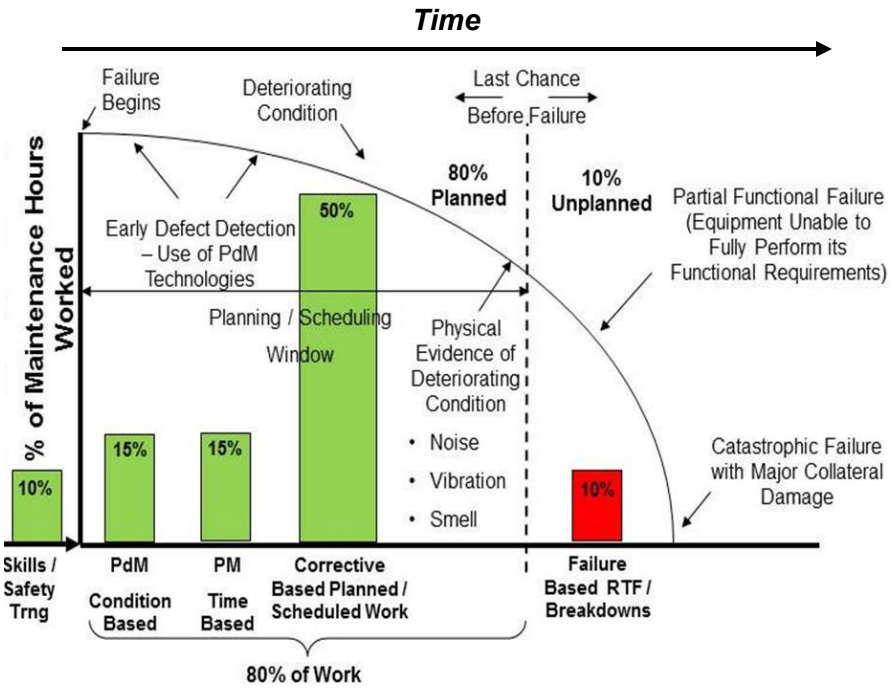
Harper's equipment that supported plant capacity ranged in age from the early 1980s through today. During the initial rebuild, root causes were discovered upon inspection showing degradation of critical components that directly affected the product quality and measured consistency. Symptoms found are listed below:

- Pressure control of the furnace
- Material deposits formed along hearth plates in high temperature zones on the tow path
- Production material deposited on the bottom stack of the pusher plate causing a jack-knife effect inside furnace
- Elevated amperage conditions in high temperature zones (tuning SCR's)
- Humidifier system operation (lacked understanding of the importance of dew point control)
- Banking (idling) the furnace to balance throughput

Pulse™ Case Study: Partnership for Manufacturing Excellence

Implementation

Harper and our client formed a dedicated team to understand the current condition and operation of key equipment components and define a scope of supply to be accomplished during each rebuild. Through site data and inspection, the team found that atmosphere, internal pressure and flow were the contributing factors to lost reliability. Continued efforts to refine process controls over yearly operational change will define best practices and allow for documented improvements as facility personnel may change from retirement or promotion. Harper's Pulse™ group successfully completed the short term objectives and initiated long term goals through collaboration of our experienced staff consisting of Process Technology Specialists, Service Technicians, and Technical Support Engineers.



Process Technology: Pressure control was restored through correcting the misalignment of the nitrogen curtain that caused a negative pressure region to form, allowing air flow that degraded the internal graphite and carbon components. The controls were tuned to throttle pressure upon opening and closing the furnace door—in order to maintain a steady internal profile.

Maintenance Training: Controlling the dew point is very important during the sintering process. Introduction of moisture into the gas stream is necessary to accomplish the mechanical properties of the material to change with respect to temperature. The humidifier system was not being utilized properly so Harper documented the proper operation of the humidifier system and discussed during site training.

Operational Support: High temperature furnaces require a long heat-up and cool-down cycle. Banking the furnace is a means of lowering the idling temperature if production demand changes without having to completely cycle the furnace. Although this is not a preferred method, it may become necessary as customers' needs change, Harper's engineering group documented the recommended procedure if banking the furnace became necessary.

Pulse™ Enlightened Service

Today's demands for superior quality, performance, reliability, minimized downtime and ever-tightening delivery schedules in foreign and domestic markets requires a new level of timely aftermarket service. Harper's comprehensive Pulse™ team service offers one-call technical support, domestic and overseas field service, proactive preventative maintenance programs, fast-turnaround genuine replacement parts, and engineered solutions for a broad spectrum of your service and maintenance requirements.