OSART Good Practices
MAINTENANCE
Spare parts and materials

Smolensk, Russia

Mission Date; 5-22 Sep., 2011

Maintenance use of shuttle storage units for efficient withdrawal of tools for maintenance work and optimization of storage area.

The automated shuttle storage unit is designed to store the small size and frequently used spare parts and materials in 26 small compartments. With the using of this storage equipment, it provides the following advantages:

- Reduction of time required to spot the necessary spare part.
- Reduction of the number of unnecessary movements of a storekeeper; the designated movable tray slides out of the shuttle on a storekeeper's demand.
- Efficient and handy location of spare parts.

The automation of the storage areas in warehouses allows preparing the spare parts and tools required for maintenance works in advance, speedup the process of getting the set of spare parts per the daily maintenance work schedule and optimization of the use of storage areas, storage processes and resources.

Gravelines, France

Mission Date; 12-29 Nov., 2012

Information Technology (IT) tools connecting the maintenance and logistics departments in relation to repairs and operation experience (OPEX).

The plant has developed an in-house IT tool to connect the maintenance and logistics departments in relation to repairs and OPEX. Through the use of this IT tool, the maintenance department can track, in real time, the repairs requested and the status of repairs. The logistics department can access all data relating to repairs requested by maintenance, and data on all repairs are collected for OPEX purposes.

It provides the following advantages:

- Improved analysis for OPEX on repairs with spare parts requirements:
  - Number of identical spare parts requested for stock supply and replenishment purposes;
  - Quality of spare parts requests;
  - Stock efficiency on plant;
- Improved relationship between maintenance and logistics.

Through the use of this IT tool, the timeliness of spare parts delivery has improved, access to spare parts and repair status information has been facilitated, and OPEX related to repairs is both simpler and more exhaustive.

Kozloduy, Bulgaria

Mission Date; 26 Nov.-13 Dec., 2012

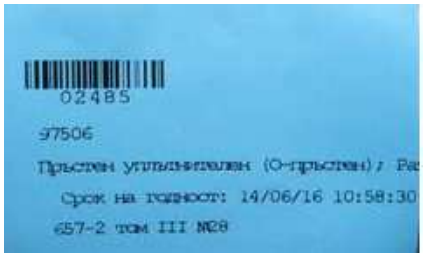
Color coding of labels of spare parts and materials

The barcode labels of items inventoried in the central warehouse and in the shop warehouses at the plant have different color depending on their safety significance. The color coding makes a clear distinction between the spare parts and materials requiring special attention (i.e. spare parts and materials intended for systems, structures and components (SSC) important to safety, or with limited shelf-life) and the items not important to safety, or without special requirements.

The colored barcode labels used at the plant are:

RED:

- spare parts for SSC important to safety;
- chemical products for primary circuit equipment, safety systems equipment and safety-related normal operation systems, which comply with the norms for halogens and sulphur content (oils, greases, solvents, reagents, etc.)



BLUE:

spare parts and chemical products with limited shelf-life e.g.: rubber items - O-rings, belts, seals, graphite gaskets; packings; chemical products - greases, degreasers, rust converters, glues, etc.

GREEN:

chemical products which do not comply with the norms for halogens and sulphur content for use on the primary circuit equipment, but are within the norm for use on the secondary circuit equipment.

white colour	all the other spare parts

Shelf-life information provided by the manufacturer for limited shelf-life items is recorded in the warehouse management system.
The shelf-life information is visualized on the blue label which is placed on those spare parts and materials when they are inventoried. Bulk materials are consequently labeled when distributed for use. For example greases purchased in large containers are distributed to maintainers in tins which are labeled similarly.

This warehouse management system decreases the risk of using inappropriate spare parts and materials on equipment important to safety, and also draws attention to spare parts and materials with limited shelf-life.

The use of color coded labels can be easily applied with insignificant expenses.

Krsko, Slovenia

Mission Date; 15 May-1 Jun., 2017

Reverse-engineered and additive technology, (3D printing).

The plant has, together with a vendor, reverse-engineered and produced an impeller for a Fire Protection Pump.

Drawings were unavailable which is why the reverse-engineering with laser scanning was performed. The lead time was reduced by approximately 50 percent for both the engineering and manufacturing lead time. This method may benefit other plants because it enhances of replacements of important components in a timely manner, reducing the time that equipment is out of service because of lack of spare parts.

The manufacturing of the impeller was performed by using lasers to fuse together high-performance materials layer by layer, (3D printing).

Stringent quality and safety assurance requirements required extensive testing that was performed jointly by the vendor and the plant, over several months, ensuring that the new 3D-printed part would perform safely and reliably.

The stainless steel 108mm diameter impeller for a Fire Protection Pump made with new additive technology (3D printing) has been in operation since January 2017. The plant implemented quality requirements to the part to get high quality product with all documentation. The original impeller had been in operation since the plant commissioning.