South Korean Best Practice, Applied to Malaysian Ship-Repair and Shipbuilding (SRSB) Industry

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At the recent LIMA 2015 exposition in Langkawi, the Malaysian Ship building/Ship Repair Industry Report 2015/2016 was launched by the Minister for MiGHT, Dato' Mah Siew Keong.

Photo 1: KD Lekir on blocks undergoing SLEP and Refit at the Boustead Naval Shipyard (BNS)

In the report, Prime Minister Datuk Sri Najib bin Tun Haji Abdul Razak wrote: "The SBSR industry must continue to be resilient and maintain its competitiveness. All players must prepare to face the challenges in the next few years until the price stabilises".

Some of these challenges may be classified as:

- Technology
- New approaches in improving productivity
- Overcoming cost of production
- Improving capability and competency

This article will share a viable approach to improving capability and competency which will then translate into project closure meeting completion date, within cost, at the predetermined time and quality.

A BIT OF HISTORY

About 140 years ago, the shipbuilding and ship-repair industry was crude and basic. Automation was unheard of and shipyards did not have the sophisticated technology of modern day. Almost every piece of work had to be done manually.

Today, technology has advanced greatly. Automation has improved production time tremendously and the use of machines has enabled finished products that are close to perfection. What used to take 1,000 man-hours 100 years ago, could probably be done now in under an hour. As stated in the SBSR 2015/2016 Report, one of the key strategies to intensify the application of science and engineering in the industry is "to apply local design and adopting new SBSR technologies" .

Looking to neighbouring countries for new trends and approaches to improve production design and work execution, has started and one of the initiatives seen today is the South Korean Best Practice.

In improving efficiency in ship repair projects as well as shipbuilding, a service agreement between Might Meteor Advanced Manufacturing (MMAM) and a subsidiary of Malaysian Industry Government Group for High Technology (MiGHT) was signed. This put into realisation the presence of South Korean specialists in Malaysia to offer consultation services and best practices with regards to ship-repair projects .

PRACTICAL TRANSFER OF TECHNOLOGY

The service agreement included bringing in South Korean specialists with years of experience in ship repair and shipbuilding (SRSB) to join the project management team at Boustead Naval Shipyard (BNS). This was in support of the BNS shipyard rationalisation programme where delivery was according to the stipulated completion date, failing which a heavy penalty would be imposed on BNS by the Government.

Complementing the South Korean team were six other Malaysian members of the project team as part of the under study and training of the local complement. The case in point was a ship belonging to the Royal Malaysian Navy (RMN). The *KD Lekir*, a Corvette Class surface combatant built in Kiel, Germany, in early 1980s, was undergoing refitting and a Service Life Extension Program (SLEP) at BNS.

The team joined the shipyard in November, 2013, and the contract was for 15 months, ending in February 2015, four months after the scheduled completion date of the *KD Lekir's* repair programme on 30 October, 2014.

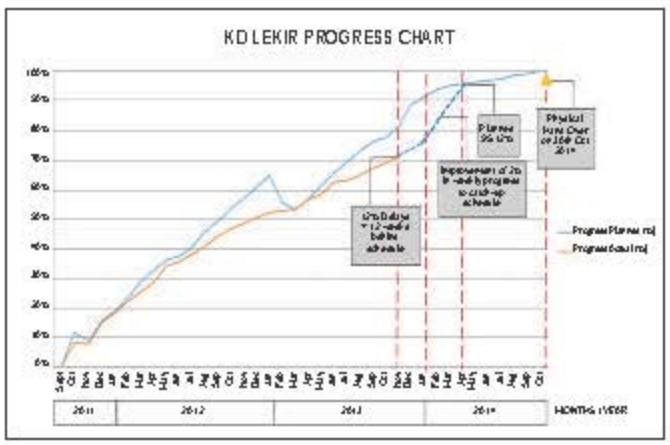

Fig 2: The status of repair progress as at November, 2014

The Malaysian-South Korean team went to work with the shipyard's project management team (PMT) and began the laborious task of setting the pace for a South Korean Best Practice. The repair work had already started but progress was rather sluggish. (See Photo 1 for status of progress). The chart showed a 12-week delay. At this rate, the shipyard would definitely be slapped with late-delivery charges (LD).

In Fig 2, the blue line is the projected representation and the red line is the actual progress, a delay equivalent of 12 weeks. The task was to gradually bring the gap closer so that, at the end of the project, the result would be the two lines meeting.

In the beginning, the task seemed difficult but under the guidance of the competent South Korean shipyard experts and the experienced locals who had been in the ship-repair industry for more than 20 years, progress was starting to show after the first two months.

BRIDGING THE GAP

Initially, the team (South Koreans and locals) had to understand the current practice at the shipyard in terms of the following:

- the culture and the ability to accept change
- establishing team-working of the South Korean practice
- alignment of processes against objectives and
- optimal utilisation of shipyard strength and capability.

The above helped the team to quickly identify the shortfalls that existed in the current shipyard practice. Once these were established, the next step was to blend the South Korean Best Practice with Malaysian culture, a task that would later prove to be quite a challenge.

APPLYING THE SOUTH KOREAN BEST PRACTICE

One of the South Korean Best Practice methods is the Zone Out fitting approach. Work flow would be represented in a diagrammatic form (Fig 3). The fundamental action would be to focus on Production Engineering and Production Planning. With these two in place, *KD Lekir* was classified into divisions called "zones". The zones were then embedded into the Project Master Schedule (Gantt Chart).

Individual zones would be filled with information that included jobs to be done, in order for the zone to be completed. These jobs included details of outfitting, piping, electrical and HVAC. Against the Gantt Chart, completion dates were identified.

Next was designing the work processes that would be required to be done in each zone, and a production system was drawn up. At this juncture, the Detailed Work Procedure (DWP) was drawn up, indicating exactly what jobs were to be done and the man-days that were required.

Once completed, these elements were processed through the Integrated Hull Outfitting & Painting (IHOP) and Integrated Commissioning And Testing (ICAT). The IHOP took care of the production element and the ICAT took care of the testing and commissioning after the

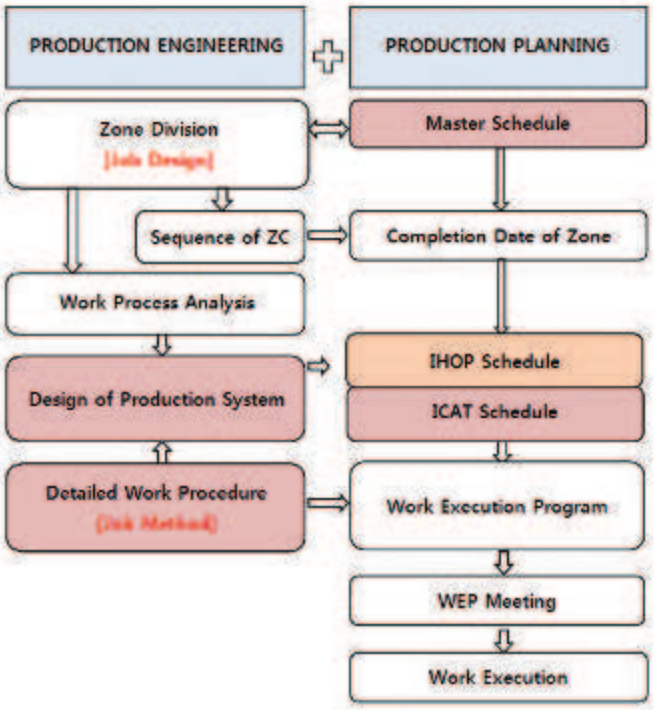

Fig 3: Fundamental Zone Outfitting Structure adopted for KD Lekir

production process was completed. This dual action resulted in the progressive completion of work done by zone, according to the Project Master Schedule.

Any discrepancy or partially completed job within each compartment belonging to a zone, was listed down in a Punch List and the list pasted on the door of that particular compartment. This way, the project supervisors and lead production foremen could quickly identify what was required to clear the compartment and subsequently, the zone. Using this method, the zones were completed in sequence as according to the Gantt Chart and, as they progressively met completion target dates, the gap of the delay would also gradually close up.

With this approach, work execution became more visible instead of cluttered, as all the jobs within each zone were immediately identified and shortfalls quickly addressed and resolved. However, this feat would not have been accomplished without the other elements of the South Korean Best Practice.

OTHER ELEMENTS ENHANCING THE SOUTH KOREAN BEST PRACTICE

Besides the IHOP and the Zone outfitting, other elements such as the 5S improvement initiative, kaizen (philosophy of continuous improvement), culture evolution and leadership are some other elements that also need to be inculcated in the work-force. Organisation can improve through:

- a clear strategy or objective
- engaged leadership
- motivated work-force and
- effective management tools .

Contributing to the success of the project was the clear objective (the ship must be completed and handed over to the RMN by 30 October, 2014) and the top-down drive from the Top Managementat Boustead Head quarters in Kuala Lumpur as well as the Shipyard Director and his Steering Committee. Though initially sceptical about the new initiative, the Management, the Director and the Committee proved to be a great help in ensuring the completion of the project.

At first, the workers couldn't see the value but coaching and numerous "*bans*" (a South Korean practice where the foremen and workers gather in the morning before work starts, to discuss what needs to be done and by when, including material short falls they face and how the problem can be alleviated), proved helpful. The walk-about and the walk-the-talk were also South Korean practices that were adopted religiously.

Finally, effective management tools such as project management software and 5S as well as kaizen helped. One obvious fundamental element that accelerated the success story was "leadership" and it was not just top leadership but leadership at all levels that contributed to the success. Without strong dedicated leadership, it would have been impossible to achieve the objective. Leadership is one element that many organisations fail to address.

CONCLUSION

A full 10 days before the deadline of 30 October, 2014, *KD Lekir*, now a fully operational warship, was successfully delivered back to its owner, the Royal Malaysian Navy. The shipyard was praise for achieving this feat and it also saved on financial costs.

From an engineering stand-point, it is not impossible to accomplish tasks that seem formidable if engineers bring together their experiences and expertise, and as long as they are willing to try and arecommitted to completing the task, with strong leadership guidance.

Leadership guidance from the top down to all levels, works well with implicit integration backed by sound engineering practices and work ethics. In the *KD Lekir* project, a local shipyard was willing to learn from the South Koreans who had years of experience in the ship repair industry, adopted their Best Practice and adapted it to the local work culture through experienced local engineers.

The new challenge now would be to sustain this. ■

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