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Managing waste: what are the options?

In his second article for *IT&O*, Martin Bjerregaard – director of D3 Consulting Ltd, specialist in complex waste management in decommissioning, dismantling and salvage – looks at some solutions for safely and cost-effectively managing the waste produced from salvage and decommissioning projects

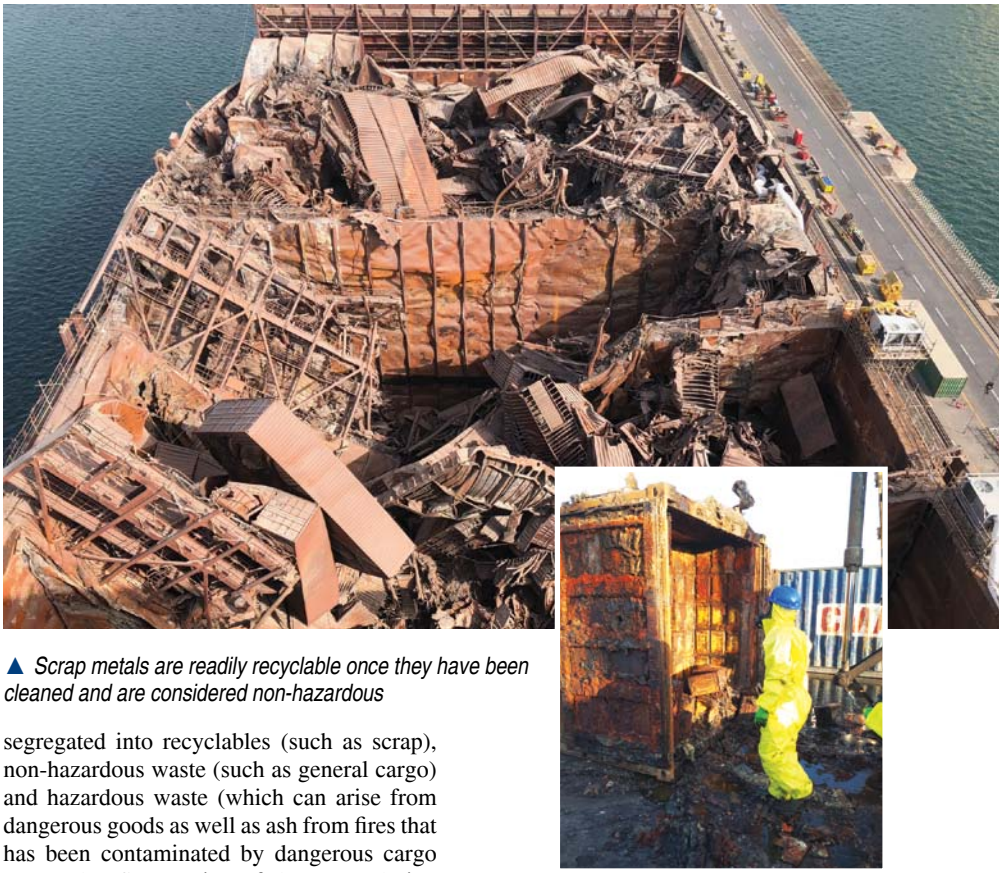
In the first article of this series, we covered defining and understanding the waste that has been generated from a salvage project – including regulatory compliance, waste characterisation and ownership of the waste. In this second article we look at how this waste can be managed in a cost-effective and safe way.

Best practice in all cases is to work to 'waste hierarchy' principles: aim for re-use and recycling where possible, with disposal as the last option:

- Re-use of materials for their original purpose is challenging in salvage projects, as most materials will be damaged from the incident. Some cargo may be recoverable and returned or sold on a case-by-case basis;
- Recycling of the waste is a more likely outcome. Scrap metals are readily recyclable once they have been cleaned and are considered non-hazardous (note that ash can often be hazardous and thus contaminate scrap). Additional recycling options include treatment by processes such as accelerated carbonisation, which can transform an ash into a recycled construction material for use in roads or building blocks, thus creating a value from the waste.
- Incineration in a waste-to-energy plant or an incinerator is a feasible option for non-recyclable wastes. This is an option for solid wastes (used to fuel waste-to-energy plants) or hazardous wastes (typically burnt in bespoke incinerators).
- Treatment of a hazardous waste to 'neutralise' it into a non-hazardous – and thus more readily disposed of – waste is also an option. Technologies include cementation or solidification where the waste is mixed with a solidifier (cement) and made into blocks that can be disposed of.
- Disposal: landfilling of the waste is often the least environmentally favoured option but also the most common from a practical aspect, since the waste typically does not require treatment and can be dispatched direct from site. However, with landfill becoming more expensive alongside tighter environmental regulations, the cost-effectiveness of this option varies across the globe.

Some of these waste management options can be established at the site where the salvage waste has been brought onshore, for example where larger quantities of waste exist and are stored. Such plant as mobile incinerators or carbonisation plants can be established at the site on a temporary basis to just deal with the salvage waste generated, or the waste can be brought to stationary waste treatment plants.

It is important to ensure that the waste is segregated into recyclables (such as scrap), non-hazardous waste (such as general cargo) and hazardous waste (which can arise from dangerous goods as well as ash from fires that has been contaminated by dangerous cargo or metals). Segregation of the waste during the salvage operations, or once the waste has been brought to a waste site, is thus key to reducing the quantities of hazardous waste – often the most expensive type to handle.



▲ *Scrap metals are readily recyclable once they have been cleaned and are considered non-hazardous*

When determining options for waste arising from a salvage operation, the following aspects need to be taken into account:

- Location of the waste, which jurisdiction it comes under, and the characterisation of the waste (see *IT&O* Jul/Aug 2019, page 50);
- Quantity and types of waste: there will need to be a certain quantity of waste to merit onsite treatment, versus dispatching to a stationary waste treatment plant;
- Locally available waste management options within the country or jurisdiction of the operations – ie, is disposal of hazardous waste available, are recycling plants accessible, do they have the capacity to deal with the quantities of wastes arising, etc?;
- Export of the waste to another jurisdiction that may have more cost-effective waste treatment capability;
- Costs relating to the various waste management options available, including any pre-treatment costs needed to segregate the waste before dispatch or treatment, and costs for storing waste until decisions have been made regarding its management;
- Risks relating to the various waste management options, including regulatory requirements, technical capability to deal with often complex wastes, schedule and capacity, as well as operational issues such as packaging and receipt of the waste.

The default option for a lot of salvage waste is landfill. However, since some of it may be hazardous (thus incurring a high disposal cost), it is prudent to assess the viability of segregation for recycling or incineration before opting for disposal. Using a cost-benefit analysis, and taking into account the aspects listed above, the optimal waste management options can be determined and implemented.

Selection of the waste management option should also take into account contractors' availability to carry out the works, and capacity of the waste management plants to receive the wastes generated from the salvage project.

In the next article we will be presenting various approaches to engaging the waste management supply chain to ensure regulatory compliant and cost-effective completion of the works.