

DANGEROUS AND MEDICAL WASTE MANAGEMENT ON BOARD DISNEY CRUISE LINE COMPANY SHIPS

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Abstract

The present paper presents, in a clear-cut manner, the overall management of dangerous waste and, in particular, of medical waste on board Disney Cruise Line (DCL) ships. In a previous paper, we analyzed the company's environmental policy and cruise waste management, while another paper focused on waste collection, sorting and storage methods on board DCL company ships, as well as on their food waste management.

The paper is based on the analysis of the activity performed by the fleet's environmental protection personnel, on the company's internal regulation, as well as on field observations and the data collected by the specialized personnel. This complex work aims to analyze the prevention of the DCL cruise ships' environmental impact by means of a rigorous dangerous waste (including medical waste) management. DCL is one of the global leaders in the entertainment industry, but also one of the "greenest" and most eco-friendly players in the field. The paper complements the findings of other studies conducted on this somewhat understudied topic.

The paper concludes that DCL aims to minimize its ships' environmental impact by choosing environmentally-friendly methods and technologies for its dangerous waste management system, as well as by making an effort to reduce waste amounts and associated risks on board the ships. In 2013, DCL was declared the most environmentally-responsible cruise line. The company complies with all national and international environmental regulations, laws and conventions. The keywords that best define the framework that ensures the company's eco-friendly approach, well-functioning operation and full compliance of integrated environmental policy norms are keeping thorough records, monitoring, oversight, awareness, responsibility and constant communication.

Keywords: Disney Cruise Line, environmental policy, dangerous waste management, medical waste management, on board

1 INTRODUCTION

Over time, environmental issues have become a responsibility undertaken by all ecologically conscious stakeholders worldwide. The development of an ecological degradation prevention strategy entails the implementation of mechanisms and policies that result in both economic growth and environmental conservation, and that focus on increasing responsibility, awareness and involvement, as well as economic

efficiency, i.e. minimizing costs related to the reduction of environmental damage generated by human activities. Being environmentally responsible is the key to creating an impeccable reputation and major commercial value.

The present paper presents in a clear-cut manner the management of dangerous and especially of medical waste on board DCL ships. In a previous paper, we analyzed the company's environmental policy and cruise waste management, while another paper focused on waste collection, sorting and storage methods on board DCL company ships, as well as on their food waste management.

The paper is based on the analysis of the activity performed by the fleet's environmental protection personnel, on the company's internal regulation, as well as on field observations and the data collected by the specialized personnel.

This complex work aims to analyze the prevention of the DCL cruise ships' environmental impact by means of a rigorous dangerous waste management. The company is one of the global leaders in the entertainment industry, as well as one of the "greenest" and most eco-friendly players in the field. The paper complements the findings of other studies conducted on this somewhat understudied topic (Letson, Suman and Shivilani, 1998; Johnson, 2002; Burgin, Hardiman, 2011; Ulnikovic et al., 2012; Kizielewicz, Lukovic, 2015; Lasserre, Tetu, 2015).

Disney Cruise Line is an enterprise affiliated with the Walt Disney Company (Manoiu and Antonescu, 2017). It was founded in 1996, initially under the name Magical Cruise Company Limited, based in London, UK, with its operational headquarters in Celebration, Florida (Manoiu and Antonescu, 2017). The DCL is currently running four cruise ships (Manoiu and Antonescu, 2017): Disney Magic, Disney Wonder, Disney Dream, Disney Fantasy.

The environmental responsibilities on board DCL ships are held by the captain, the environmental officer, the chief engineer, the B mechanic, and finally by all crew members (Manoiu and Antonescu, 2017).

2 DANGEROUS WASTE MANAGEMENT

Waste management on board the ships is a responsibility shared by all crew members and departments. Failure to comply with the regulation may result in disciplinary reprimands and even termination of employment (Manoiu, 2018).

Department heads must ensure that all departmental collection points are fitted with the appropriate containers based on the type of activity, the proper procedures are applied for sorting and transferring waste to the treatment area, all crew members are trained on the correct waste management methods, and that waste sorting and handling operations are carefully monitored. They are also responsible for ensuring full compliance with waste management regulations in their respective areas (Manoiu, 2018).

The US Environmental Protection Agency has classified some of the waste that is generated on board as dangerous - waste that, given the nature of constituting elements or characteristics, can be harmful to human health or to the environment if not discharged appropriately.

The DCL fleet is classified as a small generator of dangerous waste, which enables the company to discharge a total monthly amount of 1000 kg per ship. If the allowed amount is exceeded, the Environmental Officer must notify the Logistics Officer in order for the latter to contact the Safety, Security and Environmental Policy Department for further instructions.

2.1 Dangerous Waste Storage and Packaging

Dangerous waste, other than flammable waste, as well as materials that cannot be processed on board the ship, are transferred to the waste processing area or to a location designated by the Environmental Officer for storage and packaging before being discharged on land.

Non-flammable dangerous waste is stored in the cold storage room. Dangerous waste must not be stored for more than ninety days in this facility (Manoiu, 2018). Special containers must be used for storing dangerous waste on board.

Before the dangerous waste reaches the storage area, the environmental officer must make sure all labeling was done correctly, the appropriate containers are used and that they are in good condition, material safety data sheets (MSDS) are available, and that incompatible materials are sorted out, in order to reduce associated risks (DCL, 2016).

When containers must be discharged, the Environmental Officer contacts the Logistics Officer to make the

necessary arrangements for discharge and transfer.

2.2 Discharge of Dangerous Waste on Land

The Environmental Officer monitors the amount of dangerous waste and the on-board storage duration in order to ensure compliance with the 90-day limit.

When dangerous waste is set for discharge, the Environmental Officer draws up the necessary papers and requests the approval of the Staff Captain. The Environmental Officer then submits a preliminary list, at least 7 days before docking, to the logistics and procurement department. The list must feature the date and time of discharge, number of containers, contents, and the number of required empty containers (if appropriate).

The logistics and procurement department contacts the waste processing company to set up the transfer, and the environmental officer confirms the date.

One day before the ship docks, the Environmental Officer sends the Shipboard Proforma Invoice to the Hotel Stores Manager and notifies local authorities about the waste discharge operation.

A copy of the transfer's customs papers is sent to the logistics department.

The Environmental Officer ensures that the entire waste amount to be discharged is packed and labeled correctly, and that a copy of the customs papers is available. If empty containers were requested, the contracting company hands them over to the Environmental Officer for the on-board transfer. When the company reaches the location, the Environmental Officer contacts the Customs Officer upon starting the discharge procedure, after which, together with a waste processing company representative, checks the paperwork and inspects the containers (DCL, 2016).

When both parties agree on the procedure and documentation, the waste is transferred from the ship onshore directly to the transportation vehicle of the contracting company. The Environmental Officer ensures that the contracting company alone (and no any other entity) takes charge of the dangerous waste.

Once the waste transfer to the vehicle is completed, a report is signed (also by the Environmental Officer), which will be annexed to the Hazardous Waste Log. The Environmental Officer is responsible for recording the discharge of dangerous waste in the Hazardous Waste Log.

Within 30 days of the discharge operation, the collection company submits a copy of the report to the logistics and procurement department to confirm compliance with all local regulations. The original document is sent to the Environmental Officer, who will annex it to the Hazardous Waste Log. Dangerous waste documentation is kept on board for 3 years (DCL, 2016).

2.3 Procedures for Waste with Particular Characteristics

The multiple types of waste that appear in a ship's various waste flows require special care before being discharged onshore.

Dangerous waste must be transferred, organized, stored and treated in accordance with the dangerous substances regulations in force (U.S. Government Publishing Office site. 40 CFR 261.33).

Certain types of special waste need not be discharged as dangerous waste if treated beforehand in order to eliminate dangerous substances or if tested periodically to confirm the absence of any dangerous characteristic, or both. For instance, photographic waste that is treated in order to remove silver is not classified as dangerous. Similarly, aerosol tubes/cans that have been punctured are not considered dangerous. Incinerator ash is tested periodically for dangerous elements.

2.4 Responsibilities

Each department is responsible for the dangerous waste it generates.

The Environmental Officer is responsible for collecting, labeling, transferring, planning, storing and discharging dangerous waste, and for drawing up the necessary papers.

The Environmental Officer must ensure that each type of waste is classified correctly and that discharge instructions are made available. The MSDS can feature information on necessary precautions and suitable discharge methods. If the type of waste is unknown, it will automatically be deemed dangerous and treated as such until it can be classified accurately.

The head of the department that generates a given type of dangerous waste submits a waste transfer form to

the Environmental Officer in order to start the discharge process. The department head must make sure that all objects are labeled and packed correctly, and that they are accompanied by the MSDS. Once these phases are completed, the Environmental Officer plans the waste transfer (DCL, 2016).

2.5 Discharge of Dangerous Waste as a Matter of Urgency

If, for any reason, there is dangerous waste that must be discharged urgently, the Environmental Officer informs the ship Captain, the Logistics and procurement department, and the Department of Maritime and Technical Operations. All details pertaining to the dangerous waste in question are sent to the waste collection company as soon as possible. The logistics department contacts the collection company to set a transfer date, and notifies the Staff Captain, Environmental Officer, Department of Maritime and Technical Operations, and the DCL incident center on the agreed upon date (DCL, 2016).

Following these procedures, normal waste transfer operations are undergone, including drawing up the necessary documentation and logging.

3 MEDICAL WASTE

On board a ship there are several waste flows that pose a threat to the marine environment if discharged incorrectly. The discharge procedure for these types of waste requires special care. Some of the waste can be processed or tested on board the ship in order to check for the presence of dangerous elements or to remove any dangerous characteristics before disposal (Fig. 1). Medical waste is part of this category.

The medical department generates a series of types of waste that require special processing. Guests also generate dangerous bio-waste (e.g. insulin syringes). Such waste must be classified correctly in order to ensure a proper discharge. Dangerous bio-waste must be collected in special red bags and transferred directly to the waste collection and processing area, before it is discharged on land and handed over to a company that specializes in dangerous bio-waste disposal. This type of waste can also be discharged on board the ships by incinerating the red bags. Low contamination single-use articles that can be washed (towels, napkins) are sent to the laundry unit in yellow bags. Red and yellow bags must not be used in any other cases (DCL, 2016).

Pharmaceutical Products (unused or expired). Many pharmaceutical products can be returned to the supplier if the packaging is sealed and intact. This option must be checked before considering the discharge or disposal of any such product. The disposal of expired pharmaceutical products is regulated by complex norms and must be executed in compliance with specific requirements or after checking in with the Environmental Officer. There are several categories of pharmaceutical products on board, and disposal methods differ from one category to another. The Senior Doctor is responsible for overseeing the disposal process on board the ship. He or she must brief the Staff Captain and Environmental Officer when there is pharmaceutical waste ready to be discharged. In order to reduce the amount of pharmaceutical products that is disposed of on board the ship, the head nurse must continuously monitor the expiration dates of all such products (DCL, 2016).

The medical department must return unused/sealed pharmaceutical products to suppliers. If the products were opened, they must be processed on board or discharged on land for further processing.

Drugs should be incinerated on board the ship. The Staff Captain, Environmental Officer, Senior Doctor and nurse must assist the narcotics incineration process. The doctor will subsequently file a report and keep the original, while a copy will be sent to the onshore Medical Operations Department.

The medical department must keep a record of all pharmaceutical products that were returned to the supplier, disposed of on board the ship or discharged on land for further processing. P-coded drugs in 40 CFR 261.33 (e), including the empty containers that were used for storage, must be discharged as dangerous waste (U.S. Government Publishing Office site. 40 CFR 261.33). Drugs that are not classified as P (including empty containers) are discharged on land or incinerated.

Sharp waste that can puncture human skin upon contact. Sharp objects cannot be collected together with other dangerous bio-waste and must be placed in the dedicated container located in the ship's health center. When these containers are three quarters full, they must be transferred to a unit that specializes in dangerous bio-waste (DCL, 2016).

Containers for sharp objects must not be used for other types of waste, such as the red bag category or P-coded drugs. Sharp objects and red bags can be discharged on land and shipped together.

Sharp industrial waste. Sharp materials are used in several of a ship's work areas and generally include

blades, needles, pins, knives or other objects that can puncture human skin. Sharp industrial waste is classified as sharp medical waste.

When sharp industrial waste must be discharged, it must be placed in dedicated containers. Several work areas are fitted with such containers.

Department heads must train their teams on how to correctly discharge these materials.

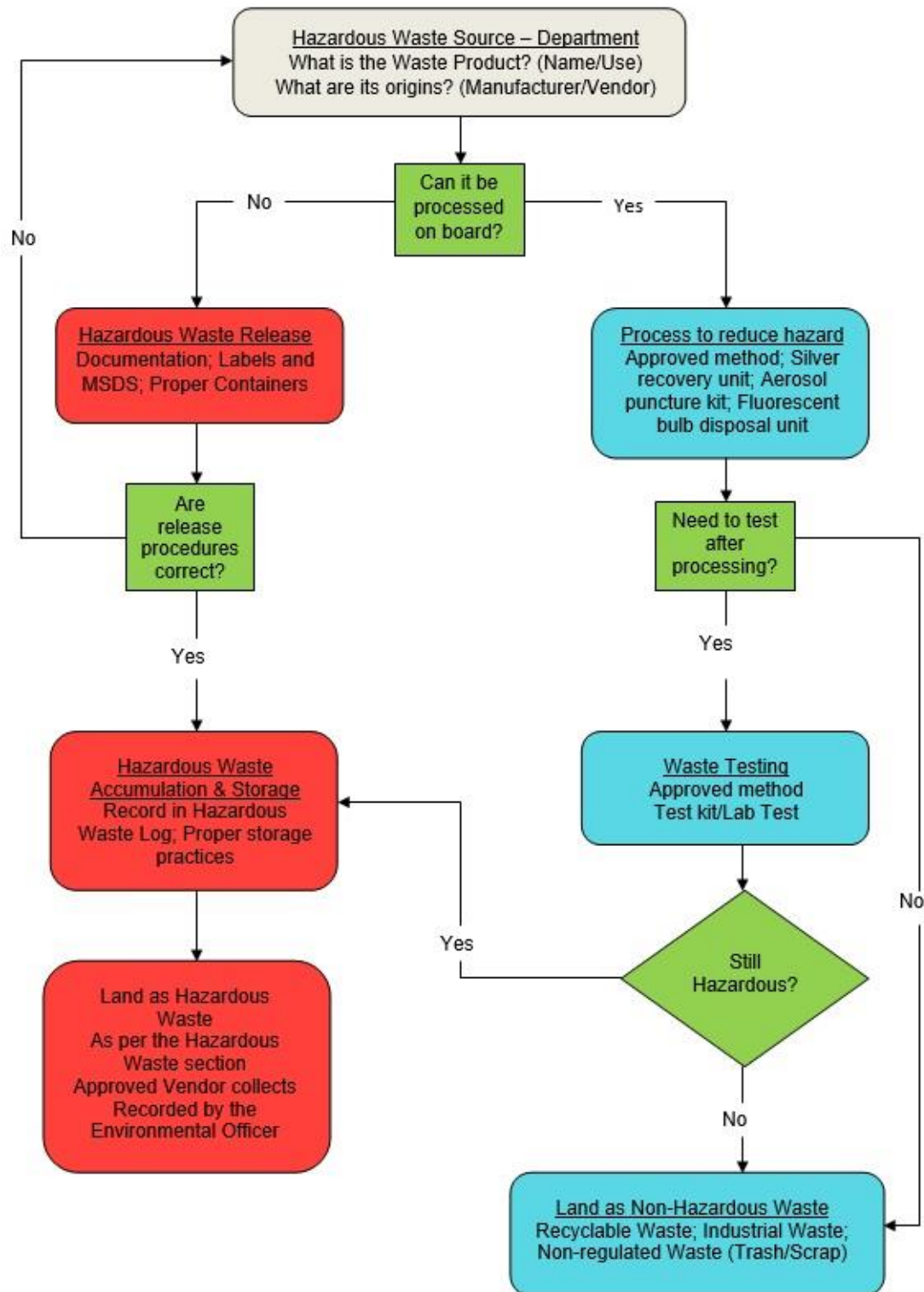


Fig. 1 Method used for classifying dangerous waste before discharge (DCL, 2016)

Sharp industrial waste containers are replaced by the Environmental Officer whenever necessary. They are discharged together with other sharp materials. The Environmental Officer is also responsible for maintaining the minimally required sharp waste container stock on board the ship (DCL, 2016).

CONCLUSIONS

In order to minimize its environmental impact, DCL uses eco-friendly methods and technologies, and ensures an environmentally-sound dangerous waste (including medical waste) management, all while making a genuine effort to reduce waste amounts and associated risks by properly training both employees and clients.

In 2013, Disney Cruise Line was declared the world's most environmentally responsible cruise line, according to the Cruise Industry Environmental Report Card (Elks, 2013). The company complies with all national and international environmental regulations, laws and conventions.

All crew members are responsible for complying with the DCL company's environmental requirements and policy. Both crew members and customers must pay attention to practices that can result in accidental dangerous waste (including medical waste) pollution. Dangerous waste collection, storage and discharge operations, as well as the prevention of improper overboard discharge of waste are carefully supervised by everyone onboard.

The keywords that ensure a well-functioning operation and the full compliance of integrated environmental policy norms are keeping thorough records, monitoring, oversight, awareness, responsibility and constant communication.

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