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| **Title**  Technical Audit for the Performance Evaluation of Incinerators at Selected Primary Health Care Facilities | | **Funding Code**  4920/A0/05/010/011/001 | | **Type of engagement**  Consultant  Individual Contractor | | | **Duty Station:**  Sana’a | |
| **Purpose of Activity/Assignment:**  Conduct a technical performance Evaluation of De Monte Forte Incinerators installed in seven pilot primary health care facilities and provide recommendations for scaling up use of the same incinerator model in additional health facilities. | | | | | | | | |
| **Scope of Work:**  **Background:**  Health care waste generated from health facilities is the second most hazardous type of waste after radioactive waste. It is generated as a by-product from the health care services. Although the majority of the health care waste is similar to general waste, a small portion (25%) of it represents infectious waste which poses a high health risk to the health workers and communities.  The composition of hazardous entities in the health care waste includes sharps (1%), body parts (1%), chemical or pharmaceuticals (3%), and radioactive, cytotoxic and broken thermometers (less than 1%).In primary health care facilities (PHCFs) including health centers (HCs) and health units (HUs) smaller quantities of waste are expected; the average weekly quantities of sharp medical waste is around 6kg and non-sharp is around 20kg. There are no body parts waste in PHCFs.  However, the situation is alarming when considering the increase in the rate of nosocomial infections – or infections contracted through the health care setting - worldwide, e.g. recent studies indicates that 33% of the hepatitis B and 42% of hepatitis C infections are occurring due to direct or indirect exposure to infectious waste (1). In Yemen, the most common practice in primary health care facilities is to co-dispose medical waste (without segregation) with the normal domestic waste in the open dump sites for open burning. The third- party monitoring report, Round 5, found that that while 91% (92% for HC & 90% for HU) of monitored HFs are segregating waste material in the facility before disposal of waste, only 17% (16% for HC & 17% for HU) of all HFs segregate waste materials in containers that were coded, or marked waste containers (2). Some HFs face challenges on final waste disposal either due to lack pf proper disposal facilities (e.g. incinerators); lack of knowledge or training on how to properly use the facilities; lack of proper protective equipment to use the incinerators; lack of resources to operate existing incinerators, amongst others.  Health Centre Waste Management (HCWM) system is the process to help ensure proper hygiene in the health care setting, and safety of heath care workers and communities. It includes planning and procurement, construction and staff training, proper use of the tools, machines and pharmaceuticals, proper disposal methods inside and outside the health facility and evaluation. The HCWM system enables health facility staff to manage the health care waste responsibly, without harming the communities or the environment. A HCWM system consists of a hardware component including waste disposal unit, tools and equipment, trained personnel to perform and supervise, and a system to transport and disposed of hazardous waste from the point of generation to disposal unit.  As a pilot project some incinerators have been constructed by UNICEF WASH in some Health Facilities (HFs) in Yemen over the last two years. The project was initiated after the assessment conducted by UNICEF WASH team to assess the health care waste management system.  The Emergency Health and Nutrition Project (EHNP) is intending to support the installation of incinerators (De Montfort Incinerator) for primary health care facilities (with prioritization of health centers). This type has been accepted in many countries of the world and has been installed by WHO in different hospitals e.g. Algamhori Hospital, Saada Gov. and AlThawrah H., Hodeidah Gov and by INGOs in Yemen e.g. CRC in at least 3 sites in Abyan governorate. Under EHNP, UNICEF conducted an assessment through Third Party Monitoring (TPM) which identified HFs for implementing corrective actions and presented recommendations of medical waste management & disposal options.  To ensure that these incinerators cause no harm to the environment, an environmental audit will be prepared to review key risks and impacts related to the suggested incinerators. This is a requirement from the EHNP in order to improve the installation of incinerators at the additional health facilities in need as identified by the TPM.  While it is known that there are some environmental impacts of incineration, the cost of mismanagement of the medical waste is much larger. However, in order to mitigate the associated risks, the incinerator must be constructed according to the technical guidelines along with training of the sanitary staff and following the best practice for its operation reducing the volume of objectionable flue gases.  **De Montfort Incinerator**  The De Montfort Mark 8-A incinerator model was selected as a suitable option of waste disposal for these group of health facilities (attached is a detailed technical specification). The incinerator is actually a double chambered refractory structure having metal components in the form of waste loading door, ash removal door, and chimney. The incinerator operates on burning of medical waste in specific temperature range from 600 C to 900C. The temperature range should be monitored by a high temperature digital thermometer mounted with the main structure. Close monitoring of the controlled burning reduces the emission of dioxin and furan which are the main objectionable environmental pollutants of incineration. Waste is loaded from waste loading door after preheating using kerosene oil as supplementary fuel. The temperature is maintained in the desired range by waste loading frequency. After burning of infectious waste in the primary combustion chamber, the toxic gases find passage in the secondary combustion chamber where further oxidation reduces the amount of dioxin and furans as a result atmosphere receive less polluting flue gases. This waste disposal unit will get rid of approximately 6-7 kg of infectious waste per hour and can be operated for two hours daily five days a week following the best operation practices.  In order to advise on the way forward for medical waste management, and especially medical waste requiring incineration, UNICEF will hire a consultant with the following ToRs.  The consultant will visit the following facilities:   1. Health Unit Al Mangadah, Kharef District, Amran Gov 2. Health Center Al Sararah, Gabal Yazid, Amran Gov 3. Health Center Alrago, Mareb City, Mareb Gov 4. Health Center Mandarah, Rahbah District, Mareb Gov 5. Health Center Kabod, Wesab Al Ali, Dhamar Gov 6. Health Center Al Ta’awon Wesab Al Ali, Dhamar 7. Health Center De Naeem District, al mawsata, Al Baida   Objectives of the health facility visits will include:   * Assess the waste management practices (liquid and solid healthcare waste), * Evaluate the efficiency of the incinerators and any observed or potential environmental or social safeguards risks against existing standards for its operation, and * Engage in a consensus with HFs administration on the recommended actions * Finalization and submission of project report, detailing the findings on current usage of these incinerators and recommendations considering their suitability and needed actions to mitigate any environmental or social risks posed.   **The specific tasks to be performed include:**   1. Evaluate the performance and efficiency of the incinerator in terms of: a) efficiency of the incineration process, including combustion chambers’ temperature b) safety of the incinerator’s operation c) environmental and social impacts (including health impacts on staff and surrounding community) of resulting residual materials after the incineration process, against existing standards for its operation (detailed technical specifications and operating standards will be provided to the selected consultant) d) soundness of incinerator’s location at each facility. 2. Assess the current practices of the healthcare waste management, including waste collection, segregation, temporary storage and final disposal of solid and liquid wastes with associated occupational health and safety aspects and availability of required materials, containers, safety boxes…etc; and linkages with improving the efficiency of the incinerators, leading to recommendations on training and capacity building needs of staff in HFs that use the recommended incinerator. 3. Assess the condition of incinerator in comparison with its standard design and required operational inputs i.e fuel consumption…etc. and advise remedial measures in case of any discrepancy found. 4. Provide the estimates of the capital expenditures of the incinerator the capital expenditure of incinerators includes materials/fabrication costs, labor costs, and costs associated with management and training. 5. Advise and provide recommended measures to improve the performance efficiency of incinerator by preparing the maintenance schedule and inventory list. 6. Identify the key healthcare waste management issues and challenges faced by the health facility staff, including existing institutional arrangements for medical waste management inside each facility, availability of proper documentation of collected and disposed wastes. 7. Identify the priority activities and interventions required to improve the health care waste management practices. 8. Advise on the environmental, health and safety soundness and economic feasibility of this type of incinerators to be replicated in other health facilities in Yemen. 9. Consultation with the communities and the HFs workers and visitors is essential. The report and recommendations should reflect their views, opinions and suggestions, if any.   **Remuneration:**  To be quoted by Consultant.  The payment will be as follows:   * Upon signing: 10% * Upon submission of draft report: 40% * Upon submission of final report accepted by EHNP Core team and UNICEF WASH specialist: 50%     **Assignment Deliverable**   * Technical Report including recommendations Final Report (Soft and Hard copies) | | | | | | | | |
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| **Budget Year:** | **Requesting Section/Issuing Office:** | | | **Reasons why consultancy cannot be done by staff:** | | | | |
| *2020* | *Health and Nutrition* | | | *Specialized technical capacity required* | | | | |
| **Included in Annual/Rolling Workplan***:*  Yes  No, please justify: | | | | | | | | |
| **Consultant sourcing:**  National  International  Both  **Consultant selection method:**  Competitive Selection (Roster)  Competitive Selection (Advertisement/Desk Review/Interview) | | | | | | **Request for:**  New SSA  Extension/ Amendment | | |
| **If Extension, Justification for extension:** | | | | | |  | | |
| **Supervisor:** | | | **Start Date:** | | **End Date:** | | | **Number of Days (working)** |
| *Farhana Zuberi, EHNP Program Manager* | | | *10th July 2020* | | *10th August 2020* | | | *30* |

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| **Work Assignment Overview** | |
| **Minimum Qualifications required:** | **Knowledge/Expertise/Skills required:** |
| Bachelors  Masters  PhD  Other  **Enter Disciplines**  Environmental Science, Public Health, sanitation, health care management, or related. | 1. The candidate should have a masters degree in environmental sciences / allied sciences. 2. Eight years working experience on health care waste management and public health would be an advantage, including familiarity with the incinerator model under evaluation and a knowledge of the standards and expectations for its operation 3. Experience in report writing in English for UN and donor audiences 4. Strong analytical skills, communicating and negotiation skills |
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| **Administrative details:**  Visa assistance required:  Transportation arranged by the office: | Home Based  Office Based:  If office based, seating arrangement identified:  IT and Communication equipment required:  Internet access required: |
| **Request Authorised by Section Head** | **Request Verified by HR:** |
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| *Approval of Chief of Operations (if Operations): Approval of Deputy Representative (if Programme)*  *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*  *Representative (in case of single sourcing/or if not listed in Annual Workplan)*    *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* | |
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