

III – Operation Management Requirements

TABLE OF CONTENT

3. OPERATION MANAGEMENT REQUIREMENTS.....	4
3.1. OBLIGATIONS OF THE CONTRACTOR	4
3.2. RESPONSIBILITY OF THE EMPLOYER.....	6
3.3. CONFIDENTIALITY	7
3.4. BASIC PRINCIPLES FOR OPERATION AND MAINTENANCE	7
3.4.1. General.....	7
3.4.2. Personnel and Organization Plan.....	7
3.4.3. Establishment Planning.....	8
3.4.4. Measurements	8
3.4.5. Requirements of the Laboratory	9
3.4.6. Scope of Maintenance.....	10
3.4.6.1. Maintenance Records	12
3.5. REPORTS.....	12
3.5.1. Daily Reports.....	13
3.5.2. Weekly Reports	13
3.5.3. Monthly Reports	13
3.5.4. Annual Reports	14
3.6. AS-BUILT DRAWINGS	15
3.6.1. As-Built Drawings and Descriptions to be Submitted for Review.....	15
3.6.2. As-Built Drawings and Calculations to be Submitted to the Employer for Information 16	
3.6.3. General Requirements for As-Built Drawings	16
3.6.4. Updates on Operation and Maintenance Manuals	16
3.6.5. Contract Completion Report and Documents.....	16
3.7. TRAINING OF EMPLOYER'S PERSONNEL.....	17
3.7.1. General.....	17
3.7.2. Training Subjects in General.....	19
3.7.3. Training Matrix	22
3.7.4. Training Evaluation.....	23
3.8. SPECIAL TRAINING REQUIREMENTS.....	23
3.8.1. General Training Requirements.....	23
3.8.2. Training Requirements – Operation	23
3.8.3. Training Requirements – Maintenance	24
3.8.4. Training Requirements – Site Support.....	25
3.9. HEALTH AND SAFETY TRAINING.....	25
3.9.1. General.....	25
3.9.2. First Aid Training	25
3.9.3. Firefighting and Emergency Response Training	26

3.10.	ENVIRONMENTAL TRAINING.....	26
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3. OPERATION MANAGEMENT REQUIREMENTS

Within the scope of this contract, the Contractor shall execute the design-build works and operation services specified in the conditions of the Contract. This section includes descriptions of the operation and maintenance plan, detailed explanations of the issues that shall be included in the Contractor's proposal, and the responsibilities of the Employer and obligations of the Contractor for the successful operation of the facility.

The Operation Service Period for Hurma Waste Sludge Incineration and Energy Recovery Facility Project is two years after the Commissioning Certificate has been issued by the Employer's Representative.

The facility shall be operated 7/24 for a minimum of 8,000 hours per year and shall provide the guaranteed operating time. The shutdown period for scheduled maintenance shall not be included in this operating time. Maintenance periods shall be assumed as a time when the facility is not in operation.

3.1. OBLIGATIONS OF THE CONTRACTOR

The Contractor shall be responsible for the supply and management of all labor, materials, tools, equipment, fuels, electricity, consumables (chemicals, water, etc.), and any necessary laboratory analyses required for the operation and maintenance of the Facility. This obligation also includes training and knowledge transfer. The Contractor shall reflect these costs to the Price Schedules, Schedule No.5 – Operation Service.

The Contractor shall also be responsible for supplying and management of the subsidiary requirements such as spare parts, telephone, internet, and other requirements during the operational service period. The Contractor shall determine the inputs of the operation services and shall supply them properly at the right time.

The Contractor's duties and responsibilities have been specified as follows;

- Management and operation in steady-state conditions of the Hurma WTE Facility both through automation and manual control systems within the conditions of the guaranteed input and output parameters ,
- Operation of sludge transferring system from the dewatering unit of Hurma WWTP to the Sludge Acceptance/Storage Unit of the Hurma WTE Facility,
- Monitoring and reporting of the processes such as Sludge acceptance/storage Unit, Sludge pre-drying Unit, Odour Control Unit, Fluidized Bed Incinerator (FBI) Unit with Heat Recovery System, Energy Recovery Unit with Steam Turbine, Flue gas Emission control Unit, Ash Collection and Storage Unit, energy management (electricity generation and consumption), efficient use of consumables, etc.,
- Ensuring the optimal operation conditions and guaranteed outputs against the variations of the input parameters (capacity amount, solid content, and calorific value of the inlet sludge, etc.) of the facility,
- Incineration of the inlet sludge shall be performed in line with national and international standards and regulations and steady-state conditions. As a result of the operation of the

facility, the required outlet emission parameters shall be achieved and the ash shall be stored in the temporary storage areas,

- Monitoring and reporting of the automation control system such as warning signs, audible and visual alarm systems, fire prevention and protection systems, process and emission control system according to the relevant standards and legislation,
- Waste management such as temporary storage, removal, and monitoring of all wastes (e.g. sand, fly ash, bottom ash, oil, laboratory wastes, chemical wastes, hazardous wastes, process water) shall be carried out in accordance with the relevant legislation,
- Storage and proper evaluation of recyclable waste materials,
- Cleaning and maintenance of the units, structures, pipelines, and channels periodically during the scheduled maintenance time specified in the operation and maintenance manuals. Necessary vehicles, equipment, and consumables shall be supplied,
- Related to procedures of Joint Inspection Prior to Contract Completion, performing any remediation works, repairing and making good any damage or defect occurring during the Operation Service Period, whether such defect or damage is notified by the Employer or Employer's Representative, or observed by the Contractor himself,
- Execution and ensure all tests for tests prior to Contract Completion defined in the Commissioning and Testing section of the Employer's Requirements,
- Implementation and monitoring of health, environment and safety plans,
- Training of the operational personnel of the Employer who will carry out the operation of the Hurma WTE Facility,
- Supplying of the required key personnel defined in the requirements of the contract and other staff,
- Preparation of booklets and brochures describing the facility and guidance for the visitors during the operation period,
- Transportations such as transportation of ash to the temporary storage areas, transportation of chemicals/any other consumables, and transportation of wastes, etc.,
- Supplying all kinds of auxiliary equipment, vehicles, and other relevant equipment,
- Supplying/storage/transferring of materials and consumables required for operational service,
- Taking the necessary precautions for odour and disinfection arising from the operation of the facility,
- Taking the necessary precautions for possible conditions of flood, fire, earthquake and any other natural disasters,
- Taking the necessary precautions for possible power failures and providing a back-up power supply (e.g. UPS system, generators) to meet the full capacity of energy requirements for the entire Hurma WTE Facility,
- Supplying the 7/24 hours of site security,

- Lightning of the facility site during nighttime operations,
- Taking the necessary precautions for insect control in the facility,
- Supplying the necessary quantity of spare parts for the equipment throughout the operational service period.

The Contractor shall be responsible for all related expenses mentioned above.

During the operation of the Facility, except routine repair and maintenance services, the Contractor shall be responsible for compensation of third-party damages such as collapse, explosion, subsidence, breakage, etc., in accordance with the conditions specified in clause 19 of the General Conditions of the Contract. However, the Contractor shall keep its teams ready for the remediation of such damages. The Contractor shall carry out the necessary repairs with the approval of the Employer's Representative, and the costs shall be covered under the insurance policy for the third-party damages. All injuries of the persons (employee and/or third party) caused by the third-party damages and accidents.

The costs for fuel, repair, and maintenance of the vehicles used in the operation, as well as compulsory traffic insurance, periodic inspections, and other related expenses, shall be covered by the Contractor.

The Contractor shall also be responsible for the costs of internet, communication expenses, maintenance, cleaning, environmental protection, and similar expenditures. Measurement and control equipment in the Facility shall be kept in working condition in accordance with the Employer's Requirements, and any malfunctions affecting the related work items shall be remedied at the Contractor's expense.

The Contractor shall be responsible for office expenses, transportation, fuel, communication, repair, maintenance, and cleaning costs.

The Contractor shall be responsible for fulfilling the legal obligations related to occupational health and safety and labor of the personnel,

3.2. RESPONSIBILITY OF THE EMPLOYER

The Employer shall be responsible for providing the required sludge in line with the operation of the Facility at steady-state conditions indicated in Annex 2 of the Employer's Requirements and Performance Requirements of Employer's Requirements, Commitments of the Employer for capacity of the Facility, and inlet solid content of the sludge.

The Employer shall be responsible for the transportation of sludge from the districts' WWTPs and Lara WWTP to the Sludge Acceptance/Storage Unit of the Hurma WTE Facility.

The Employer shall assist the Contractor in obtaining the necessary permits for operating the Facility. The Employer shall establish the necessary connections with other operators and Contractors on-site and provide support for administrative matters.

During the operation and maintenance process, the Employer's Representative shall work diligently to ensure on-site monitoring of the work. If necessary, the Employer shall assign monitoring personnel to the facility observation and central control for 24-hour process control.

During the operation and maintenance process, the Employer's personnel may work alongside the Contractor's personnel to perform qualitative and quantitative measurements within the scope of

process control. However, for the verification and examination of these measurements, an accredited laboratory approved by the Employer's Representative shall be required.,

During the Operation Service Period, the Employer/Employer's Representative shall jointly inspect the Hurma WTE Facility to notify the Contractor regarding the remediation works, repairing works and any damage or defects occurred.

3.3. CONFIDENTIALITY

The Contractor shall not share any information and documents with third parties about the transactions within the scope of the Contract during the services it provides without the approval of the Employer/Employer's Representative.

3.4. BASIC PRINCIPLES FOR OPERATION AND MAINTENANCE

3.4.1. General

The Contractor shall hand over the Hurma WTE Facility to the Employer in steady state operating conditions at the end of the contract after the Contract Completion Certificate as stated in conditions of the contract.

The Contractor shall ensure that all storage containers for consumables and additives shall be fully stocked before issuing the Contract Completion Certificate for handing over the facility as per the Handback Requirements.

The Contractor shall be responsible for the maintenance of the units/equipment/vehicles of the entire facility within the scheduled maintenance program defined in the Operation and Maintenance Manuals.

The Contractor shall comply with all legislation, regulations, and standards regarding incineration, sludge removal, emission control, wastewater discharge, and environmental protection etc.

The Contractor shall perform the following services according to the contract conditions. Below mentioned services can be executed by the Contractor's personnel or can be assigned service providers upon approval of the Employer's Representative;

- Site security of the Hurma WTE Facility,
- Transportation services excluding waste sludge transfer from the district's WWTPs and Lara WWTP,
- Environmental and Social Management services,
- Occupational Health and Safety Management services,
- Quality Assurance Management services,
- Services for cleaning and hiring of vehicles,
- Fire protection and emergency response services, etc.

3.4.2. Personnel and Organization Plan

The Contractor shall assign key personnel regarding the qualifications defined in the Section III – Evaluation and Qualification Criteria of PART 1 – Bidding Procedures of Bidding Documents and General Information of Employer's Requirements, and related key personnel shall perform full-time

on-site. In addition to the key personnel, the Contractor shall assign adequate staff who may work in shifts or without shifts during operating the facility.

In accordance with the working system of all personnel working in shifts or without shifts;

Requirements of the Contractor's personnel such as transportation, communication, health and safety, security equipment and clothes, etc. shall be provided under the responsibility of the Contractor. All expenses related to these requirements shall be covered by the Contractor. Operating activities shall be carried out within the framework of the same working principles on official and religious holidays. For the public holidays, the Contractor shall notify about on-duty personnel to the Employer's Representative.

The Contractor shall provide an organizational chart for key personnel and other staff to ensure qualified operation and maintenance management throughout the operation. This plan shall include the followings:

- Number of personnel required (qualifications and experience of key personnel and other staff)
- Task description of the personnel and staff for each unit of the facility
- Plans and programs for trainings

The CVs of the key personnel for Operation Service demonstrating their professional and specific experiences shall be submitted before the commissioning period in compliance with the Form PER-1: Contractor's Representative and Key Proposed Personnel of the Section IV of Bidding Documents. Approval shall be obtained from the Employer's Representative in advance who will propose different from the Contractor's proposal or change during the operation of the facilities.

The Contractor shall notify the Employer's Representative in case of sack/leave of employment and/or legal permission of any key personnel or other staff. If personnel stipulated in the sack/leave of employment, newly proposed personnel shall be assigned in compliance with Form PER-1 within 7 (seven) days at the latest with the approval of the Employer's Representative.

3.4.3. Establishment Planning

The Contractor shall provide the methodology and detailed work program for all activities of the operational services in steady-state conditions of the facility. The mentioned methodology and detailed work program shall also be submitted in the Contractor's technical proposal. During the operation service period of the contract, the Contractor's methodology and work program shall include at least the activities proposed in their proposal.

The Contractor shall also define the necessary measurement, monitoring and control to ensure reliable and steady-state operational services of all units. It is necessary to keep the methodology and work program by the Contractor during the Operational Services Period.

3.4.4. Measurements

The Contractor is responsible for executing all necessary measurement analyses for each unit of the entire facility. These analyses shall be executed to measure the capacity of the facility, generated heat and electricity energy, pressure of each unit, quantity of consumables that are necessary for the operation of the facility, outlet parameters of the emission, etc. The Contractor shall provide an accredited laboratory for the Operation Period. Following the approval of the Employer's

Representative, monthly analyses of input and output parameters shall be carried out by the approved accredited laboratory. The costs of these analyses shall be covered by the Contractor.

The Contractor shall ensure that all necessary analyses are carried out to keep the operation of the facility in steady-state conditions and shall prepare the documents for measurements and results of the analyses (including daily laboratory analyses, online measurement) for daily operation records and submit them to the Employer's Representative. In addition, the daily operation records and monthly accredited laboratory analyses shall be a part of monthly, quarterly, and annual reports. As these reports shall be a guide for the future operation of the facility, the reports should be submitted in a proper format.

Daily operation records shall include, as a minimum, the following information:

- Climatic conditions of the site,
- Quality, quantity, and ingredients of the dewatered/dried sludge,
- Quality, quantity, and ingredients of the fly and bottom ash,
- Quality and quantity of waste (process water and consumables),
- Equipment working hours of each unit,
- Energy consumption (electricity, natural gas)
- Sludge incineration performance,
- Work and activities carried out,
- Electricity and heat power Generation,
- Outlet values of the emission,
- Amounts of consumables used in the operation of the facility.

3.4.5. Requirements of the Laboratory

As it is stated in 2.5.19 Auxiliary Structures of Building Works section of Employer's Requirements, the Contractor shall design and build a laboratory unit within the boundary of the Hurma WTE Facility. Draft designs of the laboratory unit and its placement on the General Layout of the Facility and furnishing of the laboratory unit shall be submitted with the Contractor's Technical Proposal.

The Contractor shall supply laboratory equipment, plastic and/or glass materials, chemicals, other consumables, and laboratory furnishing to execute all necessary analyses (quality, quantity, and ingredients of the dewatered/dried sludge, fly and bottom ash, residue/waste/process water occurred from the process, etc.) for the operation of the facility in steady-state conditions.

The Contractor shall submit the laboratory equipment, materials, and consumables with their technical specifications and analyse methods in the Contractor's technical proposal. The prices of the equipment and materials shall be indicated in Price Schedules No.2 and No.3 and consumables that shall be used during the analyses in the operation period shall be determined by the Contractor, and their expenses shall be reflected in the Price Schedule No.5.

The measurements of the laboratory analyses including input and output parameters in daily basis shall be executed and recorded during the operation service period continuously and uninterruptedly.

On a monthly period, all laboratory analyses executed in the facility laboratory shall be verified by an accredited laboratory by the Contractor to ensure compliance.

During the operation and maintenance period of the facility, the necessary certifications and permits required under the relevant regulations -including but not limited to environmental permits, energy reimbursement certificates, incentives, occupancy permits, facility operation certificates/licenses, and document renewals- can be requested. The Contractor shall ensure that all required analyses are conducted in accredited laboratories to obtain these certifications and permits.

The Contractor shall also be responsible for covering the costs of these analyses, as well as any expenses incurred for the analysis of samples (e.g. emissions, odour, waste, sludge, etc.) collected by the Ministry/Provisional Directorate of Environment, Urbanization, and Climate Change or other relevant regulatory authorities during facility inspections.

3.4.6. Scope of Maintenance

The Contractor shall establish the Maintenance Management System in line with the characteristics of the facility units and site conditions.

Within the scope of the maintenance services, scheduled and periodic protection maintenance and precautions shall be executed to prevent malfunction of equipment and units of the entire facility in addition to repairing and remediation services.

As stated in the Design-Build Works, the Contractor shall execute the installation of all equipment and functional tests with the witness of the expertise staff of the manufacturers and the certificate of installation conformity shall be issued by the manufacturers. During the operational service period, the Contractor shall also make maintenance and service agreements with the same manufacturer companies for malfunctions and scheduled/periodic maintenance of the equipment.

The maintenance management system shall include the following:

- Maintenance planning and distribution tasks,
- Definition of the daily and long-term checklists and scheduled/periodic maintenance,
- Update maintenance manuals, standard forms, and other technical documents,
- Spare Parts, oil and consumables control,
- Twinning and knowledge transfer of the experiences and planning of trainings,
- Definitions of the precautions to prevent the recurrence of problems and failures,
- Supply and effective use of the tool kits for maintenance,
- Improvement of the maintenance works and establishment of the recommendation system to ensure the reliable and economic operation conditions of the facility.

The program of maintenance period and duration shall be submitted with technical supporting documents to the Employer's Representative for approval, after the approval of the Employer's Representative, the related program should be defined in the operation and maintenance manuals, however, in any case, maintenance activities shall be carried out at the end of each 8,000-hour operation period of the entire facility. The maintenance cost shall be included in the Contractor's operational costs. Also, all expenses arising from the failure of the Contractor shall be covered by the Contractor.

The Contractor shall keep buildings/units clean and continuously maintained in an orderly manner. If required, the sections of the facility, electrical and mechanical equipment shall be repaired and/or maintained and/or replaced in line with the relevant national regulations.

Other Maintenance Requirements

- Maintenance works automation control system of the process, CCTV and emergency response system of the facility,
- Infrastructure network (sludge/water/process water/air/gas/drainage pipelines),
- Energy transmission lines and electricity network,
- Communication lines (telephone/internet/fiber),
- Maintenance works for the access roads and fences of the facility,
- Remediation works for the irrigation and landscaping works,
- Basic maintenance for the units of sludge buildings of the facility,
- Painting works of the building/units and any other remediation works.

A suggestion system shall be established during the operational services period. This system shall ensure the implementation of measures related to performance improvements, material savings, energy efficiency, personnel optimization, and occupational safety.

According to the result of the Suggestion System, necessary revisions on equipment/machinery in the facility shall be carried out to enhance process and energy efficiencies and/or optimize staffing providing the approval of the Employer and Employer's Representative. Suggestions of the Contractor may also be discussed in evaluation meetings with the participation of the Employer, the Employer's Representative, and the Contractor. It is expected particularly from the Contractor that suggestions for operational cost reduction, and energy management (increasing energy efficiency, decreasing energy loss, and decreasing the output emission parameters beyond the regulatory requirements)

3.4.6.1. Maintenance Records

The Contractor shall record and report the scheduled and periodic maintenance, routine monitoring activities, responses to emergency failures during the operation, and maintenance of the facility in a proper format.

The expected benefit from the reporting services is to take necessary precautions against malfunctions in advance, to minimize unforeseen shutdown of the equipment/units, and to prevent any accidents.

3.5. REPORTS

The Contractor shall prepare the reports on the purpose of (a) monitoring of the operational and maintenance services, (b) certifying the entire process data to determine the operational requirements. Therefore, the Contractor shall establish a reporting system (daily, weekly, monthly and annual periods and at the end of the work) that shall include at least the following requirements.

All report formats shall be approved by the Employer Representative and the Contractor shall submit the formats of all reporting documents to the Employer's Representative within the first month at the beginning of the operation.

The reports shall be presented in English and Turkish, in both hard copy and soft copy versions.

3.5.1. Daily Reports

It shall include the results of the daily regular analyses listed below and all information related to the facility operation (malfunctions, periodic maintenance works, problems experienced, personnel status, etc.).

- Inlet feeding capacity
- Solid content of Inlet Sludge
- Natural gas consumption
- Electricity Consumption
- Electricity generation
- Consumables consumption
- Emission Measurements/Outlet parameters of emission

Events that occur during any operation day, abnormal repair maintenance activities and other unforeseen conditions shall be reported daily and/or immediately after the event. Examples of incidents that need to be reported are specified as follows:

- Events, accidents, energy outages, emission control system problems, fire risks, occupational safety problems, etc. that shall affect the process or affect the environment as a first degree of risks.
- Explosion of process pipes, equipment shutdown, uncontrolled emission leakages, major and significant equipment failures, etc.
- Occupational accidents requiring medical intervention,
- Significant occupational accidents such as fire and explosion, etc.
- Natural disasters (earthquake, flood, fire, etc.) shall be reported within one hour at the latest after the event.

3.5.2. Weekly Reports

Weekly reports shall include the results of the daily analyses given in Sub-Article 3.1 throughout the week and all information related to the ash, waste liquid discharges, and operation (malfunctions, periodic maintenance works, problems experienced, personnel status, etc.) coming out of the facility.

3.5.3. Monthly Reports

The monthly report containing the services provided by the Contractor within the month shall be submitted together with the summary of the reports prepared daily and weekly.

- Operating costs
- Composition and amount of sludge, energy, waste, etc.,
- Performance data and assessment of the sludge incineration process,
- Operational parameters
- Large-scale maintenance and operation activities,
- Chemical and mineral oil use and costs,

- Climatic conditions,
- Failures and operational risks,
- Personnel assignment and absenteeism,
- Summary of Occupational Safety Performance and accident reports,
- Use and costs of spare parts,
- Information on sludge transportation to the Facility (data from weighbridges of the district's WWTPs and Lara WWTP),
- Training activities and general information
- Operating evaluations and performance of all units of the Facility
- Emission control performance
- Energy Consumption
- Improvement of the facility, equipment revisions, etc.
- Suggestions for increasing facility operation and maintenance efficiency and ensuring operating economy.
- Environmental Impacts and significant events

The monthly report shall be prepared based on the data collected on a daily basis. Monthly reports shall be delivered at the end of the first week of the following month in English and Turkish.

3.5.4. Annual Reports

The annual report shall summarize the monthly reports and provide an interpretation of at least the following data:

- Operational evaluations and performance data of all units of the Facility,
- Emission control performance,
- Energy Consumption,
- Improvement of the facility, equipment revisions, etc.
- Suggestions for increasing facility operation and maintenance efficiency and ensuring operating economy,
- Occupational safety issues,
- Environmental Impacts and significant events,
- Quality Management Results,
- Personnel Performance and change results
- Training, visit, and inspection summaries

Annual reports shall be delivered in English and Turkish within one month at the end of the operating year.

3.6. AS-BUILT DRAWINGS

“The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact as-built locations, sizes and details of the work as executed. These records shall be kept on the Site and shall be used exclusively for the purposes of this Sub-Clause. At least two copies shall be supplied to the Employer's Representative prior to the commencement of the Tests on Completion of Design-Build” as stated in sub-clause 5.5 of GCC.

“Prior to the commencement of the Commissioning Period, the Contractor shall supply to the Employer's Representative two copies of all operation and maintenance manuals in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair the Plant and the Works. The Contractor shall supply the balance of the required operation and maintenance manuals prior to the issue of the Commissioning Certificate” as stated in sub-clause 5.6 of GCC.

The Works shall not be considered to be completed for the purposes of issuing the Commissioning Certificate under sub-clause 11.7 of GCC until the Employer's Representative has received these documents.”

3.6.1. As-Built Drawings and Descriptions to be Submitted for Review

Drafts of the as-built drawings (for sections of the works ready for testing) shall be submitted to the Employer's Representative before the Commissioning Period.

The Contractor shall submit the following drawings for each of these sections, 3 copies of as-built and 1 digital copy (USB Flash Drive) to the Employer for evaluation and comment.

- All features coordinated with the map survey network together with the general layout of the site including application, pile placement, underground services, road and drainage placement, landscaping
- As-built projects including foundations and superstructures (reinforced concrete and structural steel structures) of all facility and building structures
- Control and automation drawings
- Control and automation descriptions
- Process descriptions
- Process flow diagram
- Layout plans
- Electrical drawings
- Electrical circuit diagrams
- Mechanical Drawings
- Installation Drawings
- General panel layouts
- Cable charts
- Process and instrumentation schematic layouts
- PFD's and PID's

3.6.2. As-Built Drawings and Calculations to be Submitted to the Employer for Information

As-built drawings and calculations related to the works shall be submitted to the Employer.

The Contractor shall obtain and deliver to the Employer the completed "As-built" drawings, relevant calculations, technical information, relevant literature, manuals, spare parts tables, etc. related to the finished works within 1 month after the completion date of each equipment/unit/system.

3.6.3. General Requirements for As-Built Drawings

As-built drawings shall be prepared while the design-build works are ongoing. These drawings shall include all details necessary to facilitate commissioning and the completion of maintenance works by the Employer and the Employer's Representative.

The scale of the as-built drawings shall not be smaller A0 than the application drawings. -As-built drawings in electronic format (AutoCAD) in the USB flash drive.

3.6.4. Updates on Operation and Maintenance Manuals

The manuals shall contain detailed operation and maintenance instructions required for the operation and maintenance of the facility throughout its life period.

The manuals shall be indexed, and their contents shall generally comply with the requirements specified below. The manuals shall be complete and specific to the equipment supplied under the contract. Drawings, graphs, photographs and illustrations shall be used for easy understanding of the texts. If the manufacturer has appropriate standard brochures and they are relevant to the facility supplied, these shall also be included in the manuals.

The Contractor shall submit the operation and maintenance manuals provided for all works completed under the contract to the Employer's Representative for approval before the Commissioning Certificate, and three hardcopies and the digital format (USB) of the manuals shall be submitted after the approval of the Employer's Representative.

The Contractor shall update operation and maintenance manuals for all equipment supplied, test results, remediations, suggestions, and operational records during the operational and maintenance period under the contract. The updated manuals shall be submitted to the Employer's Representative for approval before the Contract Completion, and three hardcopies and the digital format (USB) of the manuals shall be submitted after the approval of the Employer's Representative.

3.6.5. Contract Completion Report and Documents

The Contract Completion Report and its documents shall be submitted in 3 (three) hard copies and two digital copies (USB flash drive) in English and Turkish.

- Construction methods related to the construction of the works.
- Records of materials used in the works
- Detailed calculations including all civil, structural, mechanical, process and electrical elements related to the works.
- All the records required to be kept by the Contractor in relation to the site, works and facility by legislation or necessary permits.

- A special report on spare parts shall be submitted to the Employer's Representative three months before the completion of the Operation Service period. This report shall include the spare parts to be used after the handover of the Facility and also it shall include information about the lifespan/ware duration of spare parts and relevant equipment.
- At the end of the Operation, the Contractor shall prepare the Contract Completion Report summarizing the main activities
- Submission of the updated Operation Maintenance Manuals 4 weeks before the Contract Completion.
- Results report related to Tests prior to Contract Completion
- If any revisions are done to the project, updated versions of the as-built project shall be submitted.
- Health and Safety Plan
- Emergency Response Plan

3.7. TRAINING OF EMPLOYER'S PERSONNEL

3.7.1. General

The Contractor shall be responsible for providing comprehensive and detailed training to ensure that the Employer's personnel can operate the facility in a theoretical, technical, and practical manner as follows:

- In compliance with applicable occupational health and safety and environmental regulations,
- With safe and efficient conditions,
- In compliance with all operational permits,
- In compliance with the recommendations of the original equipment manufacturers,
- In compliance with steady-state conditions of the process,
- By taking corrective measures in case of failures under abnormal operating conditions,
- In line with best practices improved by suggestion studies during the operation period.

All training services shall be conducted by the Contractor's experienced operational personnel, who are experts in the incineration and/or waste-to-energy facility process and procedures, and have operational experience, and knowledge of incineration and/or waste-to-energy facility equipment.

During the contract, the following training sessions shall be conducted at the facility in accordance with a training management report approved by the Employer's Representative, and all expenses shall be covered by the Contractor.

The training shall be executed by the Contractor during the design-build works, trial operation, and operation service period as specified below;

1st Course - Installation of equipment

Timing: During Design-Build Works before the commencement of commissioning tests.

2nd Course - Theoretical Introduction

Timing: before the commencement of the trial operation of the facility.

3rd Course - On-the-Job Training in the first year of the operation service

Timing: Within the last three months of the first year of the operation service

4th Course - Understanding of the Operation and Maintenance Instructions in the first year of the operation service

Timing: Within the last three months of the first year of the operation service

5th Course - Re-training in the first year of the operation service

Timing: Within the last three months of the first year of the operation service

6th Course – On-the-Job Training in the second year of the operation service

Timing: Within the last six months of the second year of the operation service (not later than one month before the contract completion)

7th Course – Understanding of the Operation and Maintenance Instructions in the second year of the operation service

Timing: Within the last six months of the second year of the operation service (not later than one month before the contract completion)

8th Course - Re-training in the second year of the operation service

Timing: Within the last six months of the second year of the operation service

Training for a maximum of 10 operational personnel (minimum 10 days of theoretical training / 30 days of practical and on-site training).

Training for a maximum of 10 maintenance personnel (minimum 10 days of theoretical training / 30 days of practical and on-site training).

Training for a maximum of 10 electrical/automation personnel (minimum 10 days of theoretical training / 30 days of practical and on-site training).

Until the issuance of the Contract Completion Certificate, the operation and maintenance of the facility shall be under the responsibility of the Contractor. Besides, The Contractor shall be responsible for providing training to the Employer's personnel during the operation period as mentioned above.

During the operation period, the contractor shall be responsible for both training the Employer's personnel and the operation of the Hurma WTE facility. The participation of the Employer's personnel in the operation services during the training period does not relieve the Contractor's operational responsibilities.

The Contractor is responsible for ensuring that the operation and maintenance personnel acquire the skills necessary to operate, maintain, and repair all equipment at the Hurma WTE Facility. The Contractor is also responsible for ensuring that the operation and maintenance personnel acquire full knowledge of the use of the Operation and Maintenance Manuals.

The Contractor shall prepare and submit a Training Plan for approval to the Employer's Representative at least one month before the intended start of the first training course or

commissioning period. The training plan shall contain an outline of the courses, duration, subjects to be trained, documentation to be issued, names and qualifications of trainers, etc.

The overall purpose of the training is to enable the staff to:

- Installation of the mechanical and electrical equipment
- Operation of equipment for best practices,
- Carrying out the necessary adjustments and corrections,
- To undertake correct preventive and normal maintenance,
- To undertake troubleshooting and repair of all equipment and auxiliaries installed,
- Operating and understanding of the SCADA system,
- Programming of the SCADA system,
- Determination and selection of the necessary spare parts,
- Intervention to failures.

All materials and manuals needed for the training shall be provided by the Contractor in Turkish and English language and submitted to the Employer's Representative and Employer before the commencement of the training.

The training sessions shall be conducted by an instructor/trainer with proven experience and expertise in the relevant fields. The training shall be provided at appropriate levels for the personnel and administrators who will be assigned to the facility. Considering the number of personnel to be trained, separate courses may be conducted for different categories of personnel.

The training sessions shall be conducted in English and Turkish, and all relevant data and documents shall be in English and Turkish. The documentation and training records (including video records, presentations, attendance lists, etc.) of the completed training sessions shall be submitted to the Employer's Representative and the Employer upon completion of the training.

The Contractor shall provide all the necessary training materials and audiovisual aids, inter alia notes, diagrams, films and other training aids, and training video records, in order to give the possibility to employees to start the self-education retraining courses and to train the shift employees.

3.7.2. Training Subjects in General

The training subjects shall be executed theoretically and practically. Emphasis shall be given on practical exercises, which shall occupy at least fifty (50) percent of the training time.

The practical exercises shall include normal maintenance activities, adjustments, use of tools, measuring equipment, and workshop facilities included in the facility.

Process:

The following disciplines shall be included in the training:

- Basic process design of the facility
- Principles of basic unit processes
- Principles of process optimization

- Process troubleshooting

Mechanical Operation:

The following disciplines shall be included in the training:

- Basic principles of mechanical components
- Capacities
- Maintenance works
- Tuning in the facility for the optimum performance,
- Basic fault finding and remedy of simple/typical faults
- Reading and understanding the Operation and Maintenance Manuals
- Spare parts
- Safety
- Exercises, practical and theoretical

Electrical Operation

The following disciplines shall be included in the training:

- Switchboards including control equipment
- Basic principles of electrical components,
- Basic fault finding and remedy of simple/typical faults,
- Maintenance routines,
- Detection and remedy of typical faults,
- Reading and understanding of diagrams,
- Spare parts,
- Safety,
- Exercises, practical and theoretical.

Training Program

Theoretical courses are assumed to be carried out separately for each staff category, i.e. electricians and operators. Practical courses may be for both categories.

For each course, a compendium including the training program, details on the subjects, manuals, and exercises (practical and theoretical) shall be prepared. The compendiums shall be submitted to the Employer's Representative for approval at least fourteen (14) days before the start of the particular training course.

The Contractor, the Employer's Representative, and the Employer shall finalize and mutually approve the details of each training module, including content, schedule, duration, participant requirements, and evaluation criteria.

1st Course - Installation of equipment

Timing: During Design-Build Works before the commencement of commissioning tests.

Subjects:

- Installation of mechanical equipment
- Installation of electrical equipment
- Installation of instruments

2nd Course - Theoretical Introduction

Timing: Before the commencement of the trial operation of the facility.

Subjects:

- General layout of the facility,
- Principles of function of the major components of the facility,
- Method(s) of operating the facility,
- Capacities of the facility,
- Unit processes,
- Process optimisation,
- Check routines,
- Operation and maintenance,
- Control principles,
- Occupational health and safety,

3rd – 6th Course - On-the-Job Training

Timing for 3rd Course: Within the last three months of the first year of the operation service

Timing for 6th Course: Within the last six months of the second year of the operation service (not later than one month before the contract completion)

Subjects:

- Acquaintance with the facility,
- Participation in the running-in,
- Operation of the Facility;
 - With safe and efficient conditions
 - In compliance with all operational permits,
 - In compliance with steady-state conditions of the process
 - By taking corrective measures in case of failures under abnormal operating conditions.
 - In line with best practices improved by suggestion studies during the operation period

- Fault finding,
- Automatic and manual operation,
- Configuration and operation of the SCADA system,
- Programming of the SCADA system,
- Maintenance requirements,
- Safety precautions,

4th & 7th Course- Understanding of the Operation and Maintenance Instructions

Timing for 4th Course: Within the last three months of the first year of the operation service.

Timing for 7th Course: Within the last six months of the second year of the operation service (not later than one month before the contract completion)

Subjects:

- Theoretical fault-finding procedures,
- Operation and maintenance,
- Process troubleshooting
- Ordering of spare parts,
- Ordering of consumables,
- Checking on the capacity of the facility,
- Checking on all performance parameters.
- Operation of the Facility;
 - By taking corrective measures in case of failures under abnormal operating conditions.
 - In line with best practices improved by suggestion studies during the operation period.

5th – 8th Course - Re-training

Timing for 5th Course: Within the last three months of the first year of the operation service.

Timing for 8th Course: Within the last six months of the second year of the operation service (not later than one month before the contract completion)

Subjects: Repetition of all previous subjects with emphasis on subjects requested by the Employer's Representative.

Training Location

Training shall take place at the Hurma WTE Facility.

3.7.3. Training Matrix

A structured training matrix, jointly approved by the Contractor, the Employer's Representative, and the Employer, shall be implemented. This matrix shall define the training status, training modules, and competency levels required for each training participant.

The training matrix shall clearly outline the roles and responsibilities of all employees as per the organizational structure of the Hurma WTE Facility. Additionally, it shall specify the areas requiring supporting training, the corresponding training materials, and the competency assessment methods to be applied.

3.7.4. Training Evaluation

The Contractor shall evaluate the efficiency of training by using questionnaires prepared by the Contractor for each trainee. The evaluation questionnaires shall be submitted to the Employer's Representative for approval and shall be kept by the Contractor for record.

The Contractor shall establish a systematic process for assessing, documenting, and maintaining records of the knowledge and competencies acquired by each employee before the commissioning tests.

Following the completion of each training, the Contractor shall identify and report to the Employer Representative and the Employer any personnel who have not met the required competency levels and require additional training both before the commencement of the operation service and before the Contract Completion.

3.8. SPECIAL TRAINING REQUIREMENTS

The minimum training modules specified in the following sections shall be implemented.

3.8.1. General Training Requirements

The Contractor shall provide, but not be limited to, the following training sessions for personnel assigned by the Employer:

- Site safety regulations
- Site Environmental Management System (EMS) training
- Site Quality Assurance Management System
- Recognition of completed works through the review of drawings and site visits
- Acquaintance with the emergency response system (firefighting equipment, fire drill, evacuation, and first aid)
- Fire protection/fire detection, telecommunication systems, closed-circuit TV (CCTV), and building services

3.8.2. Training Requirements – Operation

The Contractor shall provide training to the Employer's operation personnel, including but not limited to, the following subjects:

- Relevant forms and schedules to ensure system security during improvement and maintenance activities
- Review of the operation manual and explanation of reporting techniques
- Electrical protection and switchgear equipment, including equipment technical specifications, switching, grounding, testing, interlocks, etc., provided by the relevant manufacturer for the equipment in the facility
- The details of local installation control panels and the layout of control room equipment

- SCADA and emergency shutdown operations (including controls, interlocks, alarms, shutdowns, and status indicators) in the control room and the facility
- Local control panels for all installations and devices in the facility
- UPS/Battery arrangements (main electrical circuits, load shedding arrangements, bypass arrangements)
- Automatic transfer calibrations and regulations regarding the main and backup power supply (including manual overrides)
- Installation, operation, and local control system
- Specific procedures related to the operation, including:
 - Health and Safety
 - Emergency Procedures
 - Environmental Considerations
 - Management Security and Quality Management
 - Performance
 - Material/Equipment Orders During Operation
 - Special Operating Guidelines Related to Chemicals

3.8.3. Training Requirements – Maintenance

The Contractor shall provide training to the Employer's maintenance personnel, including but not limited to, the following subjects:

- Acquaintance with the maintenance manual, schedules, and documentation
- Failure assessment and corrective actions for all mechanical and electrical systems (including SCADA, automation, and IT systems)
- Comprehensive training in IT systems and software
- Installation, uninstallation, lifting, and storage procedures for the main components of the equipment
- Maintenance and inspection of the equipment in the facility according to the manufacturer's technical specifications
- Training on maintenance procedures, including:
 - Health and Safety
 - Emergency Procedures
 - Environmental Considerations
 - Management Security and Quality Management
 - Performance
 - Material/Equipment Orders Required for Maintenance
 - Special Operating Guidelines Related to Chemicals

3.8.4. Training Requirements – Site Support

The Contractor shall provide training to the assigned Employer's personnel, including but not limited to, the following subjects:

- Layout of storage areas and inventory control process and procedures
- Facility inventory record
- Document management system (including compliance and inspection documents/records, drawings, manuals, and technical data sheets)
- Operation and maintenance planning process and procedures
- Health and safety documentation
- Environmental compliance certificate and Test/Test requirements logbook
- Training records, matrix, and training materials
- Warranty records
- Training on site support procedures, including:
 - Health and Safety
 - Emergency Procedures
 - Environmental Considerations
 - Management Security
 - Performance
 - Special Operating Guidelines Related to Chemicals

3.9. HEALTH AND SAFETY TRAINING

3.9.1. General

The Contractor shall provide the Employer's personnel with an initial site safety course at least one month before (or earlier than) the operation and maintenance training.

Within this scope, training shall be provided on the Employer's safety regulations, along with the related processes and procedures, followed by an evaluation. Additionally, personnel with additional management/supervisory responsibilities under the safety regulations shall receive supplementary training.

The training shall place special emphasis on the health and safety aspects of the work. The Contractor shall provide specific training to the relevant personnel on the use of all necessary safety equipment required for operation and maintenance activities. Related personnel shall receive all required health and safety training, and this process shall continue until it is documented that they have gained the necessary understanding to perform their tasks and maintenance activities safely.

3.9.2. First Aid Training

All personnel assigned by the Employer shall receive basic first aid training from the Contractor no later than one month before the operation and maintenance training.

Additional training shall be provided to assigned first aid personnel to obtain the national first aid certification.

3.9.3. Firefighting and Emergency Response Training

The Contractor, in coordination with the local Fire Bridge Department, shall ensure that all personnel assigned by the Employer receive basic firefighting training no later than one month before the operation and maintenance training.

Additional training shall be provided for personnel assigned as part of the firefighting team.

3.10. ENVIRONMENTAL TRAINING

The Contractor shall provide training on the Environmental Management System (EMS) and relevant environmental license procedures of the Ministry of Environment, Urbanization, and Climate Change and its provisional directorate for the personnel assigned by the Employer at least one month before the operation and maintenance training. An evaluation shall be conducted following the training.

Additionally, supplementary training shall be provided if requested by the Employer's Representative.