



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS HVA 802

**Documents to supply for Basic Engineering and
Detail Engineering**

00	12/03	First issue
Rev.	Date	Notes



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1. Scope

The purpose of this document is to defined the content of HVAC basic engineering and detail engineering.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. Basic Engineering

The content of HVAC studies are defined within the following table.

Document	Definition
HVAC basis of design	This document shall include: • External conditions • Inside conditions during winter • Inside conditions during summer • Pressurisation inside rooms • Sound pressure levels • Fresh air flow rates in each room • Exhaust air flow rates • Air change volume • Battery room with open batteries (size, location, n° of block, etc.) • Battery room with recombination batteries (size, location, n° of block, etc.) • Heat gains from equipment • Building types • Hazardous area classification • Rooms classification, activity and occupancy • U values (wall, ceiling, floor) • Utility data (with relevant properties) • Normal electrical power supply • Emergency electrical power supply • Over - design
Thermal loads calculation (month by month / day by day / hour by hour) for each building and/or room	Calculation of requested refrigerating power during summer and winter
Thermal loads calculation for each building and/or room	Calculation of requested heating power during summer and winter
Leakage air flow rates for pressurised rooms	These calculations define the requested air flow rates to maintain over-pressure inside the room Calculation method and results to be provided
Fresh air flow rates calculation	Calculation of fresh air flow rates due to the utilisation of rooms

Document	Definition
Air flow calculation for each room	Calculation of air flow due to heating loads, cooling loads and minimum air change Calculation method and results to be provided
Definition of main HVAC equipment (AHU, Chillers, Pumps, Exchangers, Power and Control Cabinets)	This definition must be realised for all HVAC design configurations Data sheets including noise levels, weights, sizes, maintenance areas, etc.
Listing of HVAC Bulk (Duct, pipe, valves, dampers, etc.)	Listing including weights, sizes, maintenance areas, etc.
Definition of Utility needs (Electricity, Sea water, Cooling water, Air, etc.)	A pre-design regarding electrical powers, water flow rates, compressed air, etc. must be provided before producing the final needs.
Ducts and Instrument diagrams (Format A0 and A3)	One D&ID must be produced per level of building and per room. Synthesis document must be delivered for easier comprehension.
Outline study of Ducting (sizing and routing)	Single line drawings must be produced for ducts. This document includes duct sizing (Format A0).
Pipes and Instrument diagrams (Format A0 and A3)	One separated P&ID must be produced per: - Chilled water system - Refrigerating unit - Condensing system Synthesis document must be delivered to easier comprehension.
Outline study of Piping (sizing and routing)	Single line drawings must be produced for pipes. This document includes piping sizing.
Sizing of accommodation HVAC risers	Elevation and plan view must be produced for each level of accommodation building
Interfaces with other disciplines	Definition of interfaces with: - Fire & gas system - Control room - Electricity network, etc. Drawings regarding interlocking with fire and gas system must be produced.

Document	Definition
Operating philosophy of HVAC system	This study includes the operating philosophy during normal and emergency phases.
Maintenance including mechanical handling for all HVAC equipment	Maintenance philosophy must be defined for each HVAC equipment. Rules must be defined for access, duty/stand-by, etc.
Specifications for Engineering Design, construction and installation	This document includes: • The HVAC additional specifications to TOTAL specifications • Description of HVAC systems • HVAC electrical architecture diagrams.

4. Detail Engineering

The content of HVAC studies are defined within the following table:

	Document
Preparation phase (A)	1. HVAC equipment pre-design 2. Basis of design issued from Basic Engineering 3. Complementary basis of design 4. Basis of design 5. Detailed layouts and elevations (structures, walls, etc.)
HVAC calculations and Engineering documents (B)	1. Document list 2. Heat gains calculations 3. Heat loss calculations 4. Over-pressure calculations 5. Fresh air flow rate calculations 6. Blown air flow rate calculations 7. Return air flow rate calculations 8. Exhaust air flow rate calculations 9. Noise reduction calculations 10. Equipment design (AHU, pumps, condensing units, chilled water units, heaters, fire dampers, grilles and diffusers, etc.)

	Document
	11. Air handling unit(s) specification and design data 12. Condensing unit or/and chilled water unit specification and design data 13. Pumps specification and design data 14. Fire dampers specification and design data 15. Duct heaters specification and design data 16. Grilles and diffusers specification and design data 17. HVAC tag list 18. HVAC equipment list 19. Equipment data sheets 20. Weights and centre of gravity of HVAC equipment 21. HVAC VENDOR list for each component 22. Equipment maintenance plan and associated drawings 23. HVAC electrical consumers list 24. Cables list 25. Cables calculations 26. Instrument list 27. Temperature control logic diagram 28. HVAC monitoring and control 29. HVAC causes & effects diagrams 30. F&G causes & effects diagrams 31. HPLC general architecture, programming, and input/output list 32. HVAC instrument air consumers list 33. Duct calculations 34. Duct specification and design data 35. Duct balancing calculations 36. Duct insulation calculations 37. Duct insulation specification and design data 38. Piping calculations



	Document
	39. Piping specification and design data 40. Buffer tank and expansion tank calculation 41. Buffer tank and expansion tank specification and design data 42. Pipes balancing calculations 43. Piping insulation calculations 44. Piping insulation specification and design data 45. "As-built" specification, data sheets, etc.
Drawings (C)	1. HVAC Flow diagram (HFD) 2. Ducting and instrument diagram (D&ID) c/w tagging 3. Piping and instrument diagram (P&ID) c/w tagging 4. HVAC plant room layout - Double line (scaled) 5. HVAC interface drawing with other disciplines (using single line drawings) 6. Duct, pipe, risers and cable penetration details - Double line 7. Ducting (scaled) - interface with other disciplines 8. Ducting (scaled) 9. Ducting - single line 10. Ducting - isometric views 11. Duct insulation typical 12. Ducting supports details 13. Piping (scaled) - single line 14. Piping - isometric views 15. Piping insulation typical 16. Piping supports details 17. Cables trays/ladders - single line 18. HVAC electrical philosophy diagram 19. Electrical wiring diagrams, cable routing



	Document
	20. Fire dampers monitoring and control principle 21. "As-built" P&IDs, D&IDs, layout drawings, etc.