

## CORE OBJECTIVES (ENY)

1. <b>Energy Engineering Fundamental</b>	Code	ES initials and Date of Assessment			
		G	K	E	C
<p><b>1.1 Social Awareness on Energy Issue</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Climate changes, fuel mix, energy availabilities, energy policy, global energy supplies, demand, reliability and security, environmental impacts in global and societal context, principles of energy efficiency and conservation, carbon footprint and life cycle emission, indoor air quality, innovative technologies and creative business/work practice for sustainable development of fuel / energy supplies and application etc.</p>	<b>K</b>				
<p><b>1.2 General for Energy Science</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Basics of energy science, mechanical energy, thermal energy, chemical energy, renewable energy, nuclear energy, electrical energy etc.</p>	<b>*C/E</b>				
<p><b>1.3 Fuel / Energy Properties and Applications</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Types, properties, combustion characteristic, hazards, efficiency, availability and resources, basic knowledge of fuel and energy applications, alternative energy fundamentals and technologies, fuel analysis techniques, quality testing and control etc.</p>	<b>*E/K</b>				
<p><b>1.4 Fuel Production and Supplies</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Exploration and refinery systems and processes, production systems and processes, transmission and distribution systems and processes, transportations and operations, retail systems and operations etc.</p> <p> </p> <p><i>* As appropriate to the company</i></p>	<b>* E/K</b>				

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<p><b>1.5 Energy Generation and Distribution</b></p> <p>It may cover the following examples whichever appropriate: Electric power and distribution engineering, elements of nuclear engineering, fusion engineering, solar, wind and ocean energy generation system, fuel cells, hydrogen and hybrid system, biofuels and biomass energy engineering, thermal fluid system, heat absorption, heat pump and heat reclaim systems, district energy and distribution engineering, alternative and renewable energy engineering, energy storage etc.</p>	*E/K				
<p><b>1.6 Energy Projects Finance</b></p> <p>It may cover the following examples whichever appropriate: Capital investments, sources of funds, tax consideration, time value of money concept, fuel and energy economic analysis, life cycle cost analysis etc.</p> <p><i>* As appropriate to the company</i></p>	*C/E				

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2. Engineering Design	Code	ES initials and Date of Assessment			
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<p><b>2.1 Design Office Practice</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Codes, standards, specifications and statutory requirements, stages of design, information retrieval, design appreciation etc.</p>	*C/E				
<p><b>2.2 Computer Aided Design (CAD) / Building Information Modelling (BIM)</b></p>	*C/E				
<p><b>2.3 Design Aspects</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Types, selection and application of various energy systems and required equipment, energy efficiency and energy conservation measures, initial and running cost estimates, customer requirements and economic drives, utilities planning and spatial requirements, buildability, operability and maintainability, total design considerations and alternative solutions etc.</p>	*C/E				
<p><b>2.4 Safety Considerations in Design</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Hazardous area classification and equipment selection, protection from fire and explosion, protection from excessive variation of operation parameters, provision of safety interlock, fail safe design, emergency stop, emergency and protective shut off, dangerous goods licenses applications and requirements, risk management and control, qualitative and quantitative risk assessment, fire and explosion computer modelling. chemical dispersion computer modelling etc.</p>	*C/E				
<p><b>2.5 Environmental Considerations in Design</b></p> <p>Environmental analysis and impact of energy systems, pollutants emissions, disposal of used fuels, environmental impact assessment, environmental licenses applications and requirements etc.</p>	*C/E				
<p><i>* As appropriate to the company</i></p>					

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3. Operational Reliability	Code	ES initials and Date of Assessment			
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<p><b>3.1 Automation</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Energy management control system and software, energy system integration, supervisory control and data acquisition (SCADA) system etc.</p>	*C/E				
<p><b>3.2 Installation, Testing &amp; Commissioning</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Procedures, preparation, testing / balancing / commissioning, guarantees &amp; defects etc.</p>	*C/E				
<p><b>3.3 Instrumentation</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Selection, range and accuracy, fuel/energy measurement and metering system, performance monitoring, calibration etc.</p>	*C/E				
<p><b>3.4 Quality Management</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Quality management system, international standards, quality control/quality assurance procedures, product quality testing and control etc.</p>	*C/E				
<p><b>3.5 Energy Systems Safety and Risk Management</b></p> <p>It may cover the following examples whichever appropriate:</p> <p>Code, standards, specifications and statutory requirements, safety management and environmental management system for production and operation facilities, dangerous goods facilities maintenance and license renewal, resource scheduling, monitoring and control, supervision and management, safety practices and procedures, risk assessment and control, chemical release and spillage prevention and protection, explosion and fire prevention and protection, leakage detection and survey, management of changes, contingency plan, emergency responses and crises management etc.</p> <p><i>* As appropriate to the company</i></p>	*C/E				

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3. Operational Reliability	Code	ES initials and Date of Assessment			
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<p><b>3.6 Energy Production, Transmission and Distribution</b></p> <p>It may cover the following examples whichever appropriate:            Fuel/energy production processes, power supplies system for the plant, plant operations, control and protection, operations, control and protection of storage, transmission and distribution systems, operations, control and protection of transportation facilities, operations, control and protection of retail, utilization facilities and appliances, modifications and decommissioning of facilities etc.</p>	*C/E				
<p><b>3.7 Maintenance</b></p> <p>It may cover the following examples whichever appropriate:            Planning and implementation of maintenance, programs for reliability and maintainability, including production and storage facilities, transmission and distribution systems, transportation vehicles and vessels etc., types of maintenance system, computer aided maintenance management, measuring instrument calibration and maintenance, emergency and major repair, fault diagnostic techniques etc.</p> <p><i>* As appropriate to the company</i></p>	*C/E				

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4. Energy Efficiency and Conservation	Code	ES initials and Date of Assessment			
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<p><b>4.1 Energy Efficiency for Buildings</b></p> <p>It may cover the following examples whichever appropriate: Building envelope, HVAC systems, electrical systems, lighting installation, water supply and drainage systems, lifts and escalators installation, performance base approach, waste heat recovery etc.</p>	*C/E				
<p><b>4.2 Operations and Energy Management</b></p> <p>It may cover the following examples whichever appropriate: Procedures, supervision/management, indoor environmental assessment and demand analysis, energy efficiency monitoring, verification and measurement, load research and analysis, smart grid and demand side management, green building initiatives and certification etc.</p>	*C/E				
<p><b>4.3 Auditing and Energy Conservation</b></p> <p>It may cover the following examples whichever appropriate: Codes, standards and statutory requirements, instrumentation and data collection techniques, site survey and simulation modelling, energy auditing techniques / tools, carbon footprint assessment and carbon auditing techniques, energy saving alternatives and conservation measures, economic assessment, cash flow and cost benefit analysis etc.</p> <p><i>* As appropriate to the company</i></p>	*C/E				

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5. Engineering Administration & Management	Code	ES initials and Date of Assessment			
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5.1 Interpretation, preparation and communication of requirements, specifications and drawings.	C				
5.2 Materials/equipment procurement procedures, tender and/or contract appraisal and administration.	C				
5.3 Planning, budgeting and cost control.	*C/E				
5.4 Estimating labour, materials, installation and transport costs.	*C/E				
5.5 Project/Work scheduling and management and information management system.	C				
5.6 Communications and Reports (a) Written reports  (b) Oral presentation	C				
* As appropriate to the company					