TSC Category	Process Engineering Management					
TSC	Process Development Management					
TSC Description	Manage process development for new or significantly altered raw materials, catalysts or products including early stage piloting, trial runs and full-scale production					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
				ECM-PEG-4002-1.1	ECM-PEG-5002-1.1	ECM-PEG-6002-1.1
				Establish process development plans for new or significantly altered raw materials, catalysts or new products which include determining process capability and the facilitation of initial production	Evaluate process development plans for the introduction of new or significantly altered raw materials, catalysts or new products into process plants	Drive innovative and progressive process development that drives business values
Knowledge				• Fundamentals of chemical engineering, chemistry and material science • Principles and methodologies in process development • Design and working principles of process units, utilities and equipment • Mass and energy balance calculations • Interrelationships between process parameters and product specifications • Methods of developing process and equipment data sheets • Production facility capability and limitations • Production scale-up planning and implementation • Strategic planning processes	• Principles and methodologies in process development • Steps and considerations for processes involving different raw materials and catalysts • Process engineering design standards • Process design modelling principles and practices • Heat and mass balance calculations • Production facility capability and limitations • Production scale-up planning, implementation and evaluation • Emerging and new technologies for use of different raw materials to enhance product quality and quantity • Project risk and risk mitigation strategies	• Business imperatives for plant manufacturing process • New product manufacturing cost modelling techniques • Emerging and new technologies for use of different raw materials to enhance product quality and quantity • Industry and technological developments in manufacturing

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Abilities				• Interpret technical information of new or significantly altered raw materials, catalysts and products • Analyse process capabilities and limitations of existing process plants • Perform engineering calculations to determine production requirements including predicted operating conditions during trial runs • Develop production plans to manufacture new products using significantly altered raw materials, catalysts and products • Develop production scale-up specifications and procedures • Conduct trial runs based on process development plans and troubleshoot problems • Communicate with production teams on process development plans	• Manage and guide process development projects or activities • Review process development plans, including engineering design basis documentation and drawings, process data for process equipment and system selection • Review plant models and data to prove process development and qualifications are robust and workable • Verify production scale-up plans and new product specifications • Identify potential process development risks and implement risk mitigation strategies • Communicate with production teams on process development plans	• Anticipate broader business implications of changing or introducing new or altered raw materials, catalysts or products into process plants • Articulate business priorities to guide process development • Align manufacturing processes across plants and other departments to deliver business objectives • Endorse production trial runs for new raw material introduction and/or new production applications • Review production scale-up standards