

**SKILLS FRAMEWORK FOR WORKPLACE SAFETY AND HEALTH
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Big Data Analytics					
TSC	Data Synthesis					
TSC Description	Analyse data to monitor the processes for operations or process flow optimisation					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			WPH-DAT-3006-1.1	WPH-DAT-4006-1.1	WPH-DAT-5006-1.1	WPH-DAT-6006-1.1
			Analyse productivity and quality indices (system index) using system algorithms to manage and sustain a unit process or process flows	Review in-flows and out-flows to maximise productivity and reduce cycle time	Define new control charts and analyse day-to-day operations that may disrupt the automation systems stability with respect to storage conditions and delivery times	Synergise data mining techniques like multiple regressions, data clustering, neural networks to develop models for process or equipment performance data analysis
Knowledge			<ul style="list-style-type: none"> User interface of tools and/or devices Quality Management Systems Data Mining and Production Modelling 	<ul style="list-style-type: none"> Process Control Plans Capacity planning Constraints management 	<ul style="list-style-type: none"> Process Flow Control System configuration set-ups Software simulations Quality Management Systems 	<ul style="list-style-type: none"> Concept of data cube Types of data clustering and their features Steps of K-means clustering Basic terms such as mean, variances, standard deviations and correlation Concept of model co-efficient and residual errors Basic terms such as Total Sum of Squares (SST), sum of squares due to regression (SSR), Sum of Squares due to Error (SSE), T-test, confidence interval Guidelines to evaluate the time series forecasting model Difference between regression and Autoregressive–Moving–Average (ARMA) models Structure of BP neural network and advantages of neural networks Data normalisation

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<p>Abilities</p>			<ul style="list-style-type: none"> • Apply Plan, Do Check, Act (PDCA) approach for production modelling • Manage the entire process flow to meet the organisation's Safe, Right and Fast requirements • Manage line production in real-time through remote or offline access 	<ul style="list-style-type: none"> • Develop activities system interface • Establish utilisation monitoring system • Update line constraints timely to planning system using big data • Improve accuracy of system to meet the highest quality, yield and delivery based on big data analysis 	<ul style="list-style-type: none"> • Perform destination and alternate storage (automation) • Analyse operations and process flow for optimisation • Define new control charts to establish process for continuous improvement • Perform data mining and/or analysis 	<ul style="list-style-type: none"> • Design a data cube and a data schema • Apply hierarchical clustering technique for quality control • Apply K-means clustering technique for quality control • Measure correlation and dependency between process variables • Build linear regression model • Evaluate regression model accuracy and model coefficient significance • Build Autoregressive–Moving–Average (ARMA) model • Develop regression mode and ARMA model for equipment auto-mould process • Develop a neural network for predicting process yield
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