National Occupational Standard for

Manufacturing Production Planner/Scheduler

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Igniting the bio-economy's brainpower

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2 A COMPETENCY FRAMEWORK FOR INDIVIDUALS WORKING IN THE BIO-ECONOMY

2.1 What is a National Occupational Standard?

In Canada, National Occupational Standards are industry-developed and validated documents that identify and group tasks/competencies associated with a particular occupation. They also describe the knowledge and skills that a worker must demonstrate to be considered competent.

The former Alliance of Sector Councils (TASC) outlined 11 guiding principles for creating National Occupational Standards (NOS). NOS for the Canadian bio-economy meet all 11 principles and are developed to meet the current and future human capital management needs of the Canadian bio-economy.

2.2 How are we defining a competency?

We define a competency as ***a set of related behaviors that describe successful performance in a designated area. It is a behavioural expression of how people integrate knowledge, skills, attributes, and attitudes to produce a value-adding result in a defined situation.***

The competency statement includes a description that integrates skills, knowledge, and actions into a sequence of activities that deliver a value-added product or service.

Performance Indicators is the term we use for the behaviours grouped under each competency that describe the level of mastery the incumbent role must demonstrate when executing a task.

For this project, we have organized the competencies into four categories.

Core Competencies are those competencies that describe the "essence of the role" — that is, they are the one to three most critical competencies that may be applicable across multiple roles in a function or job family. All levels of personnel in this function would typically share them. These competencies may also act as qualifiers that differentiate the function from other functions.

Technical Competencies are those competencies related to specific roles or professions that enable an individual to work, function, and succeed in that role. They address the various responsibilities that job incumbents encounter in a role. For example, a surgeon's technical competencies would encompass multiple surgical tools, techniques, and conditions that could be part of the position.

Similarly, technical competencies for a lawyer would contain various legal situations that they encounter in the context of a particular field of practice.

Regulatory Competencies are those competencies that describe compliance with prescribed practices and mandated obligations under applicable laws, regulations, and industry standards. They ensure that critical work processes are implemented and integrated into all work activities. They are of absolute importance where economic behaviours can impact human conditions.

Personal/professional Competencies are those competencies that enable an individual to be successful working with others and fulfilling their responsibilities in a work context. Personal and professional competencies are not necessarily role specific.

2.3 Levels of complexity of work

It is important to recognize how the complexity of work varies along an organizational continuum. At one end of this continuum is low-complexity, clearly-defined, task-driven work. At the other end of the continuum is work that is higher in complexity, not as well-defined, and requires higher-level thinking and decision-making skills and a greater degree of autonomy. Results are recognised over a longer period of time and are more difficult to assess.

Figure 1: Demonstrates how the level of complexity changes with the role responsibilities

Complexity Level	Examples of Work at Different Complexity Levels	Typical Roles/Titles
Most Complex	Construct and pursue worldwide strategic plans in large corporations.	CEOs of the largest trans-global corporations
	Construct and pursue worldwide strategic plans.	C-suite executives at multi-national organizations
	Lead the accumulated impact of multiple business units.	C-suite executive at large, multi-location organizations
	Optimize the function of a single business unit or corporate support staff.	General manager; plant manager
	Manage multiple, interdependent projects; balance resources among departments.	Engineering manager
	Plan and carry out sequential projects while considering contingencies and alternatives.	Maintenance manager
	Accumulate information to diagnose and anticipate problems; proactive; notice trends.	Maintenance technician
Least Complex	Follow predefined procedures; seek help when encountering an obstacle. The ability to anticipate problems is not expected.	Maintenance labourer

We define the complexity levels within the profiles at four levels:

Foundational — performance focus is on the execution of procedures and tasks involving own job role.

Operational — performance focus includes some discretion in the planning and executing of work. The work typically includes assessing the quality of the work outcomes and taking corrective action to ensure quality.

Specialist — performance focus is on translating goals and standards to team members and ensuring that work done under the person's responsibility area complies with all corporate standards.

Strategic — performance focus is on leading work and the accumulated impact of work in an independent business unit or across a whole organization. The impact of work at this level is often not visible until the medium to longer term.

The following example illustrates the different complexity levels within a profile.

Competency Name: Research Ethics **Competency Definition:** Exercises integrity and professionalism to ensure all research is performed responsibly in keeping with the ethical principles of beneficence and nonmaleficence. Competence at this level is demonstrated when the **Research Manager**:			
Performance Indicators			
Foundational	Operational	Specialized	Strategic
Diligently follows research procedures and protocols mandated by legitimate authorities and professional organizations.	Regularly monitors own actions and decisions to ensure they align with professional and organizational values.	Holds self and staff accountable to the organization's values, ensuring compliance with the policies and procedures related to scientific ethics and rules of conduct.	Fosters an organizational culture of integrity and ethical business practices by unwavering personal example.

2.4 Overview methodology for the development of national occupational standards

National occupational standards were developed using a multi-step process.

Step	Description	Result/Output
1	Identify critical roles in the bio-economy through primary and secondary research.	List of 50 key roles
2	Create draft profiles with critical competencies for the roles, performance, and knowledge indicators.	Draft profiles
3	Review the draft profiles with industry subject matter experts to refine the competencies, performance, and knowledge indicators.	Reviewed profile with design inputs from industry experts
4	Further validation and review by industry via online focus group.	Validated profiles by industry experts
5	Broader validation of the draft profiles via national online surveys.	Occupational Standards validated on a national level by experts from the different sectors
6	Addition of the Essential Skills and Canadian Language Benchmark (ES/CLB) ratings.	Nationally validated NOS profiles with ES/CLB profile for each NOS

3 PRODUCTION PLANNER/SCHEDULER IN MANUFACTURING COMPETENCY FRAMEWORK

3.1 Competency diagram for Production Planner/Scheduler in Manufacturing

Competencies		Complexity Level			
		1	2	3	4
Core Competency					
1	Production Planning		■		
2	Production Scheduling		■		
Technical Competencies					
3	Production Monitoring		■		
4	Production Reporting		■		
5	Production Optimization		■		
6	Supply Chain Optimization		■		
7	Quality Management		■		
Industry Regulatory Competencies					
8	Implementation of HSE Policies Within Own Work Domain		■		
Personal and Professional Competencies					
9	Communication		■		
10	Problem Solving		■		
11	Collaboration/Teamwork		■		

Complexity Level Legend

1. Foundational
2. Operational
3. Specialist/Manager
4. Expert/Executive

3.2 Definition of occupation

The Production Planner/Scheduler in Manufacturing coordinates and expedites the flow of work and materials within or between departments of the business according to the established production schedule. They review and distribute production, work, and shipment schedules, coordinate with department supervisors and production/manufacturing managers to determine progress of work and completion dates, and compile reports on the progress of work, inventory levels, costs, and production variances.

The Production Planner/Scheduler may liaise with external supply chain agents or their organization's supply chain managers in order to understand lead times, delivery cycles, minimum order quantity, and other aspects that influence production scheduling.

The Production Planner/Scheduler may also be required to liaise with maintenance department personnel to understand changeover/set-up requirements and ongoing periodic/routine maintenance requirements for production assets in order to optimize the scheduling of those assets for production.

Applicable To	Bio-Health	Agri-Bio	Bio-Industrial	Bio-Energy

The level of complexity of the role is:

Span of Complexity Levels	Foundational	Operational	Specialist/ Management	Expert/Executive

3.3 Level of education, training or designations requirements

Typical Education Required	Secondary	College	Bachelor	Master	PhD
Typical Starting Experience	0–5 yrs.	5–10 yrs.	10–15 yrs.	15–20 yrs.	20+ yrs.

- Engineering Degree/P. Eng. is generally required (chemical, bio, mechanical, automated systems, electrical, or industrial engineering degrees are all applicable, depending on the type of product being manufactured)
- Minimum five years of experience in a manufacturing/production environment is typical
- PMP certification is an asset
- Strong understanding of Lean manufacturing principles and continuous improvement processes
- Strong understanding of quality management systems (QMSs) and the related standards and their interpretation
- Strong understanding of material handling and supply chain principles
- Experience with root cause analysis techniques to investigate and resolve production nonconformances
- Proficiency with applicable computer software packages for technical/engineering design and drawing, office productivity (Microsoft Office Suite), project management, and supply chain management software is generally required

3.4 Core competencies list for Production Planner/Scheduler in Manufacturing

3.4.1 Production Planning

Gathers and interprets sales forecasts and customer orders and combines this with knowledge of production processes and capacity in order to develop long range production plans and options that will meet commitments while maximizing the utilization of internal and external production capacity and resources.

Competency in this role is demonstrated when the individual:

- Liaises with sales division to determine customer requirements/forecast in order to plan resources ahead of time.
- Liaises with QC for timely release of production batch.
- Estimates production cycle times to optimize batch sizes.
- Audits efficiency of production runs, planned vs. actual.
- Highlights the impacts of poor quality to production capacity, material, deliveries.
- Develops options to meet projected demand using internal and external capacity.
- Estimates fixed and variable costs associated with different production scenarios.

Knowledge required for competency at this level:

- Understanding of manufacturing technologies, practices, processes, and rework procedures (if any)
- Knowledge of job-estimating processes (ability to estimate the required man-hours and machine time (process time) to finish work within allocated tolerance)
- In-depth knowledge of scheduling procedures
- Knowledge of industry tools and practices to support planning
- Understanding of specific production processes for company products, including process/cycle times, lead times, and resources required
- Knowledge of machine/process capacity/capability (Planned Production List (PPL) concepts)
- Up-to-date knowledge of current market trends for specific products
- Ability to estimate material requirements and availability and machine viability and flexibility for efficient planning

3.4.2 Production Scheduling

Works with management in coordinating and planning production activities to improve runtime and optimize output from existing production capacity.

Competency in this role is demonstrated when the individual:

- Adjusts weekly/monthly production plans with current information to produce detailed schedules.

- Develops and reviews schedules with Managers for approval.
- Provides weekly production schedules to logistics/supply chain in order to ensure required materials are supplied to operations for shop floor execution of production orders.
- Liaises with customers, suppliers, the human resources department, and maintenance employees to ensure all necessary resources (workers, materials, and machinery) will be available when required.
- Organizes project paperwork and maintains records for accounting purposes.
- Organizes production meetings to discuss targets and strategies to achieve them.
- Identifies gaps, addresses unforeseen barriers, and makes all support groups (e.g.,quality testing, packaging, shipping) aware of the targets.

Knowledge required for competency at this level:

- Current knowledge of strategies to enhance workflow and process
- Knowledge of manufacturing technologies, practices, and processes
- Knowledge of job-estimating processes
- Understanding of scheduling procedures
- Working knowledge of specific production processes for company products, including process/cycle times, lead times, and resources required
- Informed knowledge and understanding of vendor qualification and raw material specifications/requirements

3.5 Technical competencies list for Production Planner/Scheduler in Manufacturing

3.5.1 Production Monitoring

Extracts information from ERP and MRP systems to detect potential production issues and liaises with production departments to adjust schedules and optimize production activities, flow, and throughput.

Competency in this role is demonstrated when the individual:

- Works closely with procurement and quality departments to support planning process.

- Reviews information from production control systems to spot developing trends and alerts appropriate leadership before processes exceed control limits.
- Participates in investigating production problems, analyzing root causes, and providing solutions/options.
- Identifies problems that occur during production, including staff shortages and machinery malfunctions, and participates in troubleshooting to prevent recurrence.
- Escalates complex issues to higher managers for resolution.
- Monitors the execution of production plan and resolves any potential issues in a timely fashion.
- Liaises with production departments and supply chain organizations to dynamically adjust inventories, delivery schedules, and production rates to ensure efficient operations.

Knowledge required for competency at this level:

- Knowledge of manufacturing technologies, practices, and processes
- Knowledge of supply chain management principles
- Knowledge of job-estimating processes
- Understanding of scheduling procedures
- Working knowledge of specific production processes for company products, including process/cycle times, lead times, and resources required
- Knowledge of problem-solving techniques
- Knowledge of quality control tools
- Knowledge of project management tools and techniques
- Strong interpersonal communication techniques (written and verbal)

3.5.2 Production Reporting

Gathers data from multiple sources to produce reports for company leaders that show actual production vs. budget, including variances in key performance metrics, for use by production managers to identify and address production issues so that overall performance targets can be achieved.

Competency in this role is demonstrated when the individual:

- Monitors and records real-time production and material costs.
- Collects and assesses data about production metrics and performance.
- Prepares reports about production processes for upper management.
- Uses applicable software and tools for planning and presentation.

Knowledge required for competency at this level:

- Knowledge of manufacturing technologies, practices, and processes
- Knowledge of supply chain management principles
- Knowledge of job-estimating processes
- Understanding of scheduling procedures
- Knowledge of job accounting processes
- Working knowledge of specific processes and technologies required for company products, including process/cycle times, lead times, and resources required
- Knowledge of appropriate data presentation software/toolssuch as Microsoft Excel, Microsoft Project, pie charts, bar graphs, and forecasting/estimation tools

3.5.3 Production Optimization

Reviews historical production data and applies Lean manufacturing processes to identify issues and develop potential solutions that will improve overall production efficiency.

Competency in this role is demonstrated when the individual:

- Effectively participates in multi-disciplinary process improvement teams.
- Provides documented suggestions to improve production flow and efficiency.
- Articulates options for improvements with cost/benefit information to facilitate decision-making.

Knowledge required for competency at this level:

- Knowledge of manufacturing technologies, practices, and processes
- Knowledge of Lean manufacturing principles
- Working knowledge of specific production processes for company products, including process/cycle times, lead times, and resources required

3.5.4 Supply Chain Optimization

Develops and publishes scientific reports and other technical documents to chronicle and advance the body of research and development (R&D) knowledge. Also creates project reports to ensure that all relevant R&D information is tracked and available to stakeholders as required and to demonstrate compliance with all regulatory requirements.

Competency in this role is demonstrated when the individual:

- Effectively participates in multi-disciplinary supply chain improvement teams.
- Provides documented suggestions to improve supply chain efficiency and effectiveness.
- Articulates options for improvements with cost/benefit information to facilitate decision-making.
- Analyzes production history to determine usage amounts, including waste, spoilage, and rejected materials.
- Communicates clearly both verbally and in writing with supply chain stakeholders to create effective working relationships.

Knowledge required for competency at this level:

- Knowledge of Lean manufacturing principles and practices
- Knowledge of supply chain principles and practices
- Understanding of team decision-making and problem-solving practices

3.5.5 Quality Management

Assists in ensuring adherence to the organization’s quality management system (QMS) as it applies to production by ensuring that the required inventories, machine/process capacity, and human capital are available to execute the required production processes.

Competency in this role is demonstrated when the individual:

- Ensures required QMS reports are prepared for decision-makers.
- Liaises with stakeholders along the value chain to ensure understanding of QMS requirements.
- Documents issues related to quality management and brings them to the attention of appropriate decision makers.
- Executes responsibilities under the QMS, adhering to reporting, traceability, and other requirements, as appropriate.

Knowledge required for competency at this level:

- Understanding of QMS requirements
- Knowledge of report writing and documentation processes
- Good knowledge and understanding of product quality principles and how to meet them from a production planning perspective

3.6 Industry regulatory competencies list for Production Planner/Scheduler in Manufacturing

3.6.1 Implementation of HSE Policies Within Own Work Domain

Ensures adherence to organization's health, safety and environmental (HSE) policies and practices in order to create a safe and compliant workplace.

Competency in this role is demonstrated when the individual:

- Applies good housekeeping practices to the workspace.
- Recognizes and addresses potential HSE hazards in the workplace.
- Effectively participates in regular HSE briefings.

Knowledge required for competency at this level:

- Knowledge of organization's HSE policies and practices
- Knowledge of industrial safe workplace good practices

3.7 Personal and professional competencies list for Production Planner/Scheduler in Manufacturing

3.7.1 Communication

Communicates strategically in verbal, non-verbal, written, listening, and two-way communication, generating enthusiasm and fostering an atmosphere receptive to open exchange and creativity, in order to ensure organizational goals and performance metrics are achieved.

Competency in this role is demonstrated when the individual:

- Uses appropriate communication modes and media, adapting the quantity, depth, and content of the information to the needs of the audience.
- Prepares clear, concise, and well-organized written documents and oral presentations.
- Conveys information clearly, confidently, and with an appropriate tone.
- Facilitates open communication.
- Uses discretion and demonstrates sensitivity to confidentiality concerns.
- Listens effectively and provides appropriate feedback.

Knowledge required for competency at this level:

- Knowledge of report-writing techniques
- Knowledge of effective verbal communication techniques
- Basic understanding of Emotional Intelligence principles

3.7.2 Problem Solving

Recognizes and reacts to issues and variances as they occur and utilizes sound techniques to gather and analyze multiple factors in order to determine and recommend appropriate courses of action.

Competency in this role is demonstrated when the individual:

- Evaluates and interprets data and formulates logical and sound conclusions and recommendations.

- Works in unconventional ways and on tasks that require creativity.
- Signals problems, recognizes important information, traces possible causes of problems, and brings forward original solutions.
- Recognizes past problems and ensures preventative actions are documented to prevent recurrence.

Knowledge required for competency at this level:

- Knowledge of system thinking processes
- Knowledge of individual and group problem-solving and decision-making principles and processes
- Mathematical/numeracy skills (addition, subtraction, multiplication, division, and conversions)

3.7.3 Collaboration/Teamwork

Uses understanding of individual and team dynamics to effectively plan and execute work with other people.

Competency in this role is demonstrated when the individual:

- Participates in multidisciplinary planning teams.
- Engages with other departments (QC, logistics, marketing, etc.) to solve problems as they occur.
- Effectively participates in continuous improvement teams.

Knowledge required for competency at this level:

- Knowledge of teamwork processes
- Knowledge of Emotional Intelligence
- Knowledge of effective team problem-solving techniques

3.8 Essential Skills for Production Planner/Scheduler in Manufacturing

Essential Skills (ES) are foundational skills required for all types of work. They are not technical skills, but the core skills people need to acquire knowledge and complete workplace tasks and daily activities.

Understanding the ES requirements for a role can allow individuals to compare their skills to those required, assist training/learning providers in developing appropriate supports to ensure ES levels are developed during training, and provide employers with an additional tool for determining who/how to place in particular roles.

Human Resources and Skills Development Canada has defined Essential Skills as follows:

- Reading
- Document Use
- Numeracy, which is further divided into:
  - Money math; Scheduling, budgeting, and accounting math; Measurement and calculation math; Data analysis math.
  - Several different factors related to estimations, including the presence of a set procedure, the number of items being estimated, the consequences of errors in estimation, the amount of information missing, and the accuracy required.
- Writing
- Oral Communication
- Thinking Skills, which are further divided into:
  - Problem Solving
  - Decision Making
  - Critical Thinking
  - Job Task Planning and Organizing
  - Finding Information
  - Significant Use of Memory
- Digital Skills
- Working with Others
- Continuous Learning

Most of the ES have levels based on complexity, and a role can be analyzed to determine the appropriate levels of ES. The exceptions are noted below:

- "Working with Others" does not have a complexity rating: it simply describes the ways in which the role would be required to interact with other people, either internally within the organization or externally (i.e., with clients, customers, or the public).
- "Continuous Learning" does not have a complexity rating: it describes the types of learning expected in the context of the role (e.g., on the job, being mentored by others, formal training as part of the job, etc.).

NOTE: as of January 2020, ESDC was undertaking a comprehensive review of ES with the intent of adding additional skills, refining existing ones (particularly digital skills) and better aligning ES with similar approaches used in other countries. However the detail was not finalized in time to be used, therefore the profiles developed for this project follow existing standards as of December 2019.

3.9 Canadian Language Benchmark for Production Planner/Scheduler in Manufacturing

Canadian Language Benchmarks (CLB) are a 12-point scale for task-based language proficiency descriptors which were originally developed as a guide for measuring the teaching and assessment of English as a Second Language (ESL) learners in Canada. Since they were originally developed, the Canadian Centre for Language Benchmarks (CCLB) has continued to refine CLB, and it now includes scales for both English and French language proficiency. [1]

The CLB has been validated against both the Common European Framework for Language (CEFL) and the American Council for the Teaching of Foreign Languages (ACTFL) benchmarks and is considered accurate for high-stakes evaluation[2].

[1] Centre for Canadian Language Benchmarks. Theoretical Framework for The Canadian Language Benchmarks And *Niveaux De Compétence Linguistique Canadiens.* CCLB. Ottawa 2015. p8

[2] Centre for Canadian Language Benchmarks. Canadian Language Benchmarks: English as a Second Language for Adults, CCLB. Ottawa 2012 p.II

The ES levels for Oral Communication were developed with reference to the Canadian Language Benchmarks[3]. Comparative work to determine the alignment between the CLB and other Essential Skills has been ongoing, with recent work providing additional alignment with the ES for Oral Communication in both spoken and listening domains, Reading, Writing, and Document Use.[4]

CCLB has developed a set of crossover tables that align CLB ratings with ES ratings for reading, writing oral communication and document use.

Production Planner/Scheduler ES/CLB Profile

Essential Skills	Equivalent CLB Level	ES Level				
Reading	Reading: 9–10	1	2	3	4	5
Document Use	Reading: 9–10 Writing: 7–8	1	2	3	4	5
Writing	Writing: 7–8	1	2	3	4	5
Oral Expression	Speaking: 9–10 Listening: 9–10	1	2	3	4	
Numeracy	n/a	1	2	3	4	5
Thinking Skills – Problem Solving	n/a	1	2	3	4	
Thinking Skills – Decision Making	n/a	1	2	3	4	
Thinking Skills – Job/Task Planning and Organizing	n/a	1	2	3	4	
Thinking Skills – Significant Use of Memory	n/a	Types 1,2,3				

[3] Essential Skills Research Group. Readers Guide to the Essential Skills. ESDC. Ottawa ND. p57
[4] Canadian Centre for Language Benchmarks. Relating Canadian Language Benchmarks to Essential Skills: A Comparative Framework. 2015, p3

Essential Skills	Equivalent CLB Level	ES Level				
Thinking Skills – Finding Information	n/a	1	2	3	4	
Digital Skills	n/a	1	2	3	4	5
Working with Others	n/a	See Below				
Continuous Learning	n/a	See Below				

Explanation of the Essential Skills and the Canadian Language Benchmark for Production Planner/Scheduler

Reading: ES 4 CLB: 9–10

Production Planners/Schedulers read and interpret texts from multiple internal and external sources, including sales forecasts, maintenance schedules, vendor information, transportation, and logistics data, etc. in order to ensure that production can proceed with minimal disruption. They interpret sales data as well as customer demand forecasts to project the production resources that will be required in the short and long term. Reports are generally in plain language, but moderately complex technical, engineering, and/or scientific information may also be included.

Document Use: ES 4 CLB: Reading: 9–10, Writing: 7–8

Production Planners/Schedulers interpret textual, graphical, and numerical information related to production resources and sales forecasts. Information may be paper-based or digital. They may collect and interpret information and repurpose it in other reports, synthesizing and re-interpreting information for other purposes.

Writing: ES 3 CLB: 7–8

Production Planners/Schedulers draft reports and provide a variety of written materials for internal clients in their organizations. Reports are generally standardized, presenting facts and data to detail resource requirements, production forecasts, machine availability, etc. The information is used by managers to direct the day-to-day production activities of the firm.

Oral Expression: ES 3 CLB: Listening: 9–10, Speaking: 9–10

Production Planners/Schedulers communicate orally with production team personnel to convey information that will guide immediate and longer term actions within the production facility. Information must be conveyed in a clear and concise manner to people above and below them in the organizational hierarchy. They may also communicate with suppliers, vendors, and external stakeholders. Information that is incorrectly or imprecisely delivered may have moderate consequences to cost and schedule for the business.

Numeracy: ES 4 (Money Math: 4, Scheduling, Budgeting, and Accounting: 4, Measurements: n/a, Data Analysis: 3)

Production Planners/Schedulers work with forecasts and budgets to create efficient production plans that optimize available resources to generate revenue for the organization. They access and analyze historical and current production statistics to develop accurate projections for the future. They use a variety of mathematical techniques for forecasting, using established data and problem-solving models and a limited number of variables in their work. While they will generally use specialized computer software for their calculations, they must understand the underlying mathematical principles in order to validate and error-proof the computer-generated solutions and detect incorrect/inaccurate source data, and then take appropriate action to ensure the results are accurate and actionable.

Thinking Skills:

Thinking skills are subdivided into five domains:

- Thinking Skills — Problem Solving
- Thinking Skills — Decision Making
- Thinking Skills — Job/Task Planning and Organizing
- Thinking Skills — Finding Information
- Thinking Skills — Significant Use of Memory

- **Thinking Skills — Problem Solving: ES 3**

Production Planners/Schedulers solve problems related to production scheduling and resourcing. Problems generally involve a limited number of variables and dependencies and the formulae for solving the problems are known. They may be required to develop different scenarios using probability, but the parameters are limited and simple. They analyze historical information to find issues and trends that they can use for current planning, which tend to be short-term.

- **Thinking Skills — Decision Making: ES 2**

Production Planners/Schedulers make decisions related to production scheduling. Errors impact costs and productivity but are usually quickly apparent, and can be corrected and reversed. The information needed to produce a production plan is known and available, and there are established procedures and historical precedents that guide decisions. While they may need to exercise judgement, the factors they need to consider are well-defined and they can apply their technical understanding of production with the principles of planning to arrive at reasonable decisions.

- Thinking Skills — Job/Task Planning and Organizing: ES 2

Production Planners/Schedulers perform repetitive work and have limited discretion over how and when their work is performed. They can organize their work within these limited boundaries, using industry and occupation-accepted practices to determine what to do. Priorities are set by external factors (management decisions) and they react accordingly. Their work can be disrupted but this rarely involves major re-planning. They may be required to coordinate with others, particularly if there are shared resources (computer systems, data bases, etc.) involved.

- Thinking Skills — Finding Information: ES 2

Production Planners/Schedulers use a limited number of known and accessible sources of information in their work. On the occasions where they need to access new sources of information they can rely on more experienced and or senior colleagues and staff to assist them in finding the information required. Information accessed can be used immediately, or with only minimal processing or manipulation.

- Thinking Skills — Significant Use of Memory: Types 1, 2, 3

Production Planners/Schedulers must memorize multiple pieces of information in the course of their work through one or all of the following methods:

- Purposeful memorization of procedures, codes, parts numbers, memorization through repetition (Type 1)
- Remembering information for brief periods, e.g., minutes or hours (Type 2)
- Unique events in which learning occurs from exposure (Type 3)

Digital Skills: ES 2

Production Planners/Schedulers work with specialized planning and forecasting software to develop production plans and allocate resource. The processes used are generally standardized, requiring input of data that is then used by the software to make its calculations. Reports are normally automatically generated with little to no requirement to modify or customize.

Working with Others: Work Contexts 2, 3 & 4

The following work contexts and functions are relevant to the Production Planner/Scheduler role:

- Works independently (Work Context 2)

- Works jointly with a partner or helper (Work Context 3)
- Works as a member of a team (Work Context 4)

They may also be involved in supervisory or leadership activities, as follows: Functions 1–4

- Participate in formal discussions about work processes or product improvement (S/L Function 1)
- Have opportunities to make suggestions on improving work processes (S/L Function 2)
- Monitor the work performance of others (S/L Function 3)
- Inform other workers or demonstrate to them how tasks are to be performed (S/L Function 4)

Continuous Learning: Types of Learning 1, 2, 3 How Learning Occurs: 1, 2, 3, 4, 5, 6

Type of learning may include:

- Training in job-related health and safety (Type 1)
- Obtaining and updating credentials (Type 2)
- Learning about new equipment, procedures, products, and services (Type 3)

The learning may occur:

- As part of regular work activity (Context 1)
- From coworkers (Context 2)
- Through training offered in the workplace (Context 3)
- Through other forms of self-study (Context 4):
    - At work
    - On worker's own time
    - Using materials available through work
    - Using materials obtained through a professional association or union
    - Using materials obtained through worker's own initiative

- Through off-site training (Context 5):
    - During working hours at no cost to the workers
    - Partially subsidized
- With costs paid by the worker (Context 6)

4 REFERENCES

Gathering the data

The development of the National Occupational Standards started with a review of existing information for the role. This review process included: referencing books, job postings, websites, articles, and BioTalent Canada's existing skills profiles to create the first draft. After several iterations via written feedback, focus groups and a national survey with subject matter experts, the National Standards were developed. The following are sources consulted during the creation of the Production Planner/Scheduler in Manufacturing profile:

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During the research period, several job posting boards were reviewed for this profile.

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