

Instrumentation and Control Technician

On-the-Job Checklist



	Level 1	Page 1/2
Red Seal Tasks	On-The-Job Duties	Completed
Performs safety-related functions	Identify confined spaces & the requirements for entry	☐
	Demonstrate procedures for safe handling & disposal of chemicals such as buffer solutions or solvents	☐
	Participate in & understand the principles of LOTO procedures & regulations	☐
Uses tools & equipment	Operate, maintain & store hand & portable power tools such as drills, saws & tube benders	☐
	Install instrument air tubing as per site requirements & manufacturer specifications	☐
	Inspect ladder & secure prior to use	☐
	Operate tagline to control a load during a hoist	☐
Organizes work	Understand the types of drawings such as a P&ID or loop drawing & where to locate	☐
	Identify device location using a general arrangement drawing	☐
Uses communication & mentoring techniques	Demonstrate active listening practices by participating in toolbox & safety meetings	☐
Installs & services pressure, temperature, level & flow devices	Install a thermowell & temperature measuring device	☐
	Clean debris & dust from sensor to maintain device function	☐
	Verify the operation of a measuring device fuse using a meter	☐
	Replacement or cleaning of a damaged float on a level switch	☐
Installs & services pneumatic equipment	Identify the minimum operating pressure that a system's components must meet	☐
	Inspect/replace filter on an instrument air regulator	☐
	Align a control valve positioner	☐
Installs & services electrical & electronic equipment	Identify cables with wire markers prior to termination	☐
	Verify voltage presence using a multi-meter	☐
	Demonstrate the procedure to connect test equipment to measure current	☐

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	Level 1	Page 2/2
Red Seal Tasks	On-The-Job Duties	Completed
Installs & services valves	Remove a flange while observing safe line-break procedures	☐
	Verify control valve movement is smooth & stick-free	☐
	Verify the travel indicator is set as per manufacturer specifications	☐
	Replace the valve stem packing of a valve	☐
Installs & services actuators	Demonstrate the procedure to safely release spring tension on an actuator	☐
	Lubricate the moving parts of an actuator	☐
	Use snoop to inspect an air actuator for leaks	☐
	Demonstrate the procedure to isolate a valve for service	☐
Installs & services positioners	Demonstrate the procedure to change the fail-safe action on a valve	☐
	Clean dust & debris from positioner & valve body	☐
	Demonstrate the procedure to set up an I/P (current/pneumatic)	☐
	Install a replacement air regulator	☐

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	Level 2	Page 1/2
Red Seal Tasks	On-The-Job Duties	Completed
Installs & services pressure, temperature, level & flow devices	Verify pressure transmitter calibration prior to installation	☐
	Verify as-found calibration matches data sheet	☐
	Select & size the resistor for a current to voltage signal conversion	☐
	Replace a damaged transmitter display screen	☐
Installs & services signal transducers	Identify transducer installation location free from vibration & meets manufacturer specifications	☐
	Determine transducer range based upon site specifications	☐
	Calibrate a transducer to convert a 4-20 ma signal to 3-15 psi	☐
Installs & services mass, density & consistency devices	Install & tare of load cells as per site requirements	☐
	Apply temperature & pressure compensations to a flow meter	☐
	Verify that the temperature compensation of a device matches process requirements	☐
	Recalibrate the zero on a density device	☐
Installs & services control devices for hydraulic systems	Verify the fluid level in a hydraulic accumulator	☐
	Purge the air from the hydraulic system prior to testing	☐
	Replace hydraulic filters on a hydraulic power pack	☐
Installs & services pneumatic equipment	Determine instrument air loading requirements including duty cycle & air demand	☐
	Demonstrate the procedure to adjust the bench set of an actuator	☐
	Identify the cause of desiccant saturation in an air-drying system	☐
Installs & services electrical & electronic equipment	Install devices based upon area classification & hazards	☐
	Verify that cable shielding & termination is completed as per site specifications	☐
	Use a HART communicator to calibrate a field device such as a transmitter	☐

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On-the-Job Checklist



	Level 2	Page 2/2
Red Seal Tasks	On-The-Job Duties	Completed
Installs & services valves	Verify that a globe valve is installed in the correct direction	☐
	Couple an actuator to a valve & perform a bench set	☐
	Complete a bubble/leak test on a control valve to confirm trim seating performance	☐
	Replace a damaged or torn valve diaphragm	☐
Installs & services actuators	Adjust actuator travel stops as per site requirements	☐
	Complete a leak check of a piston actuator	☐
	Identify & confirm actuator direction during installation	☐
	Set the limit potentiometers of an electric actuator	☐
Installs & services positioners	Identify the fail condition required for a newly installed positioner (open/close)	☐
	Connect the positioner feedback linkage as per manufacturer specifications	☐
	Verify the mechanical stops are not interfering with the operation of the positioner	☐
	Inspect a pneumatic relay to identify & correct any leaks	☐

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	Level 3	Page 1/2
Red Seal Tasks	On-The-Job Duties	Completed
Organizes work	Plan & prepare for tasks to take place during a shutdown	☐
Installs & services motion, speed, position & vibration devices	Install & terminate a speed sensing device & cable	☐
	Calibrate a limit or proximity switch as per manufacturer's recommendations	☐
	Identify position switch fault that caused a failure to activate	☐
	Update documentation with replacement components serial number & date of service	☐
Installs & services mass, density & consistency devices	Demonstrate the procedure to safely lockout & work near a nuclear source	☐
	Calibrate & test a load cell as per site specifications	☐
	Complete as-found calibration checks on a Corolis tube	☐
	Replace a capsule on a pressure transmitter used in a density application	☐
Installs & services process analyzers	Verify sampling system settings match system & site requirements	☐
	Verify operation of automatic sample valves	☐
	Identify the buffer/reagents required for calibrating analytical instruments	☐
	Replace the column within a process analyzer	☐
Configures & services variable speed drives (VSD)	Confirm the 4-20 ma signal & operation of a VSD	☐
	Back up a VSD settings prior to service	☐
	Verify speed probe is clean & clear of filings/debris	☐
	Clean dust from VSD internals & fans	☐
Installs & services control network systems	Install a line-of-sight satellite/cellular receiver	☐
	Terminate a data cable using the pin-out established by site specifications	☐
	Replace failing network hub & confirm replacement operation	☐

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On-the-Job Checklist



	Level 3	Page 2/2
Red Seal Tasks	On-The-Job Duties	Completed
Installs & services signal converters	Install & calibrate a signal converter in a control system such as a DCS, PLC or SCADA	☐
	Identify possible causes of signal interference	☐
	Verify operation of repaired signal converter before returning to service	☐
Installs & services gateways, bridges & media converters	Update & backup system software as per manufacturer's requirements	☐
	Identify different data communication protocols & their limitations	☐
	Use diagnostic software to identify system faults or problems	☐
Establishes & optimizes process control strategies	Identify process variables & control strategy to be used in a specialized/stand-alone system	☐
	Modify PID values to improve response time	☐
Installs & services stand-alone controllers (SAC)	Identify the requirement for system protection such as fail safe & low voltage protection	☐
	Determine controller configuration according to process control strategy	☐
	Use test equipment to verify controller outputs are as expected	☐
Installs & services programmable logic controllers (PLC)	Install & address PLC I/O card	☐
	Manually change the status of a PLC bit to simulate an error	☐
	Download an updated PLC program & verify its operation & verify outputs	☐
Installs & services human machine interface (HMI)	Verify HMI pinout interfaces with the cable in the enclosure	☐
	Verify external communication with HMI & field devices	☐
	Back up a HMI configuration file	☐

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On-the-Job Checklist



	Level 4	Page 1/3
Red Seal Tasks	On-The-Job Duties	Completed
Uses communication & mentoring techniques	Demonstrate a safe-work procedure to a co-worker & provide constructive feedback	☐
Installs & services process analyzers	Review installation requirements/specifications of a process analyzer	☐
	Verify the accuracy & repeatability of an existing sampling system/analyzer	☐
	Identify the source of measurement error	☐
	Identify required system repairs & document	☐
Installs & services multiple variable computing devices	Perform loop check to confirm consistency in measured variables once termination is complete	☐
	Inspect/clean primary elements for debris /damage	☐
	Verify calculated outputs match flow standard & site specifications	☐
	Access device using manufacturer software to identify alarms/faults	☐
Installs & services safety systems & devices	Install a pressure safety device as per site specifications	☐
	Test the operation of the emergency shut down device	☐
	Record as-found values prior to service	☐
	Test & replace faulty components on safety systems	☐
Installs & services facility security systems	Install POE security cabling (ethernet)	☐
	Maintain security equipment including cleaning camera lenses, adjusting sensitivity & backing up data	☐
	Identify & eliminate the source of a false alarm	☐
	Test & repair damaged security data cable	☐
Installs & services control network systems	Verify system integrity by testing loop signal strength	☐
	Identify & reduce possible sources of interference	☐
	Confirm network operation prior to returning to service	☐

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Instrumentation and Control Technician

On-the-Job Checklist



	Level 4	Page 2/3
Red Seal Tasks	On-The-Job Duties	Completed
Installs & services safety instrumented systems (SIS)	Install low water cutoff in a boiler system	☐
	Assist the Journeyperson with the configuration of a SIS system to shut down process in a controlled manner	☐
	Test/verify the operation of the SIS system & related devices	☐
	Identify the cause of SIS system activation	☐
	Back up & document SIS system configuration/parameters	☐
Installs & services signal converters	Install a digital valve controller (DVC) to precisely control a process variable	☐
	Provide signal converter with source current to verify output	☐
	Calibrate a signal converter to provide split range outputs	☐
Installs & services gateways, bridges & media converters	Configure a laptop to communicate with various field devices	☐
	Assign gateway IP address & verify connection	☐
	Use software to check error logs & verify data transfer	☐
Installs & services stand-alone controllers (SAC)	Interlock SAC with existing systems as per site requirements	☐
	Program controller to be reverse acting	☐
	Verify output signals using a multimeter or a HART communicator	☐
Installs & services programmable logic controllers (PLC)	Understand the hierarchy & function of various PLC components including cards, power supplies & modules	☐
	Configure & test external PLC communication with other systems & devices	☐
	Verify that back-up configuration is restored to previous version to remove unauthorized modifications	☐
Installs & services distributed control systems (DCS)	Assist the vendor in commissioning the system & verifying operation matches site requirements	☐
	Verify DCS configuration according to rack & cabinet layout & site specifications	☐
	Use of diagnostic menu, software or module lights to identify DCS problems/alarms	☐

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On-the-Job Checklist



	Level 4	Page 3/3
Red Seal Tasks	On-The-Job Duties	Completed
Establishes & optimizes process control strategies	Understand process control strategy requirements & determine the type of strategy based upon the process	☐
	Tune a loop using different optimization strategies such as Ziegler/Nichols or Lambda tuning	☐
Installs & services human machine interface (HMI)	Install a HMI panel including mounting & cable termination/identification	☐
	Verify HMI operation configuration by accessing the program	☐
	Download a backup program & replace a damaged HMI screen	☐
Installs & services supervisory control & data acquisition (SCADA) systems	Install a wireless transmission antenna	☐
	Configure a SCADA system including tagging & comments	☐
	Test signal strength of a wireless SCADA system	☐

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Instrumentation and Control Technician On-the-Job Checklist

Information Regarding the Checklist

Saskatchewan Apprenticeship and Trade Certification Commission's (SATCCs) On-The-Job Checklist provides a complete list of trade-specific Red Seal tasks for apprentices to complete under the supervision of a journeyman. This work should be completed prior to attending the technical training level under which the duties are listed (e.g. Level 1 completed prior to attending Level 1 technical training).

Completing this checklist will ensure that apprentices are exposed to the full scope of a particular Red Seal trade throughout their apprenticeship program. It will also help prepare apprentices for each level of technical training by performing work on-the-job relating specifically to topics covered later on. The trade-specific tasks listed have been reviewed by certified journeymen in Saskatchewan for their accuracy and have been set to an appropriate skill level.

An apprentice spends approximately 85% of their apprenticeship term training on-the-job. It is the both the apprentice and the employer's or journeyman's responsibility to supervise an apprentice's practical skills development during their program.

To promote transparency and consistency, this document aligns with the 2020 Instrumentation and Control Technician Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

Saskatchewan Apprenticeship & Trade Certification Commission (Regina)

2140 Hamilton St Regina SK, S4P 2E3

Tel: (306) 787-2444

Toll Free: 1-877-363-0536

Website: www.saskapprenticeship.ca

Saskatchewan Apprenticeship & Trade Certification Commission (Saskatoon)

603 45th Street West Saskatoon, SK S7L 5W5

Tel: (306) 933-8476

Toll Free: 1-877-363-0536

Website: www.saskapprenticeship.ca

District Offices

Estevan (306) 637-4930

La Ronge (306) 425-4385

Moose Jaw (306) 694-3735

North Battleford (306) 446-7409

Prince Albert (306) 953-2632

Swift Current (306) 778-8945

Yorkton (306) 786-1394

All work performed in this checklist is to be done under the supervision and guidance of a certified journeyman

1-877-363-0536
apprenticeship@gov.sk.ca
saskapprenticeship.ca

