

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR INSTRUMENTATION AUTOMATION SURVEILLANCE AND COMMUNICATION INDUSTRY

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

Contact Us:

IASC Sector Skill Council
201-202 STBP NSIC
Complex (Gate No. 02),
Okhla Industrial Area,
New Delhi-110020
Phone: +91-11-41072471-3

E-mail:

info@iascsectorskillcouncil.in



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Introduction

Qualifications Pack- Calibration Technician (Thermal)

SECTOR: INSTRUMENTATION AUTOMATION SURVEILLANCE & COMMUNICATION

SUB-SECTOR: Instrumentation

OCCUPATION: Testing & Calibration

REFERENCE ID: IAS/Q5001

ALIGNED TO: NCO-2015/ NIL

Calibration Technician (Thermal) is employed in laboratories run by Calibration Service Providers and also employed in process industries such as Steel, Cement, Fertilizer, Power, Chemical and other industries, including OEMs. Thermal sensors are a vital part of closed control loop in these processes.

Brief Job Description: Calibration Technician (Thermal) is responsible for performing calibration of thermal instruments such as Thermocouples, RTDs, Radiation Detectors etc. for measuring temperature.

Personal Attributes: This job requires the individual to be disciplined, assertive, team player, possess analytical skills and problem solving ability, effective communicator and have the ability to work under pressure.

Qualifications Pack For Calibration Technician (Thermal)

Job Details	Qualifications Pack Code	IAS/Q5001		
	Job Role	Calibration Technician (Thermal)		
	Credits(NSQF)	TBD	Version number	1.0
	Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
	Sub-sector	Instrumentation	Last reviewed on	30/07/2016
	Occupation	Testing & Calibration	Next review date	30/07/2019

Job Role	Calibration Technician (Thermal)
Role Description	Responsible for performing calibration of thermal instruments such as Thermocouples, RTDs, Radiation Detectors etc. using authorized calibration setup and procedure.
NSQF level	4
Minimum Educational Qualifications	B.Sc., Diploma in Instrumentation/Electrical/Electronics
Maximum Educational Qualifications	NA
Training (Suggested but not mandatory)	Practical hands-on training in a calibration laboratory.
Minimum Job Entry (Age)	19 Years
Experience	No prior experience required
Applicable National Occupational Standards (NOS)	<p>Mandatory:</p> <ol style="list-style-type: none"> IAS/N0200 Work Place Readiness - Calibration IAS/N0201 Calibration of Thermocouple IAS/N0202 Calibration of RTD IAS/N0203 Calibration of Infrared / Non contact Temperature Detector IAS/N0204 Task Reporting-Calibration IAS/N0205 Preventive Maintenance – Thermal Calibration IAS/N2105 Work Effectively With Teams <p>Optional: N/A</p>
Performance Criteria	As described in relevant OS units

Qualifications Pack For Calibration Technician (Thermal)

Definitions

Keywords /Terms	Description
Calibration	Calibration is the process of determining and verification of the physical characteristics of a system with reference to an established primary or secondary standard for that physical quantity, as prescribed by a national or international standard. Calibration assures the integrity and accuracy of a measurement device or system. Calibrations are performed according to accepted international standards so that there is global uniformity in dealing with physical quantities and their technical, trade and economic consequences.
Core skills/generic skills	Core skills or generic skills are a group of skills that are key to learning and working in today’s world. These skills are typically needed in any work environment. In the context of the OS these include communication related skills that are applicable to most job roles.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a data base to verify that this is the appropriate OS they are looking for.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or group of persons.
Instrumentation	Instrumentation is the variety of measuring instruments to monitor and control a process. It is the art and science of measurement and control of process variables within a production, laboratory, or manufacturing area.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and understanding	Knowledge and understanding statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standards.
National occupational standards	NOS are occupational standards which apply uniquely in the Indian context.
Occupation	Occupation is a set of job roles under which role holders perform similar/related set of functions in an industry.
Organizational context	Organizational context includes the way the organization is structured and how it operates, including the operative knowledge managers have of their relevant areas of responsibility.
OS (Occupational Standards)	OS specify the standards of performance an individual must achieve when carrying out a function in the work place together with the knowledge and understanding they need to meet that standard consistently. Occupational standards are applicable both in Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standards of performance required when carrying out a task.

Qualifications Pack For Calibration Technician (Thermal)

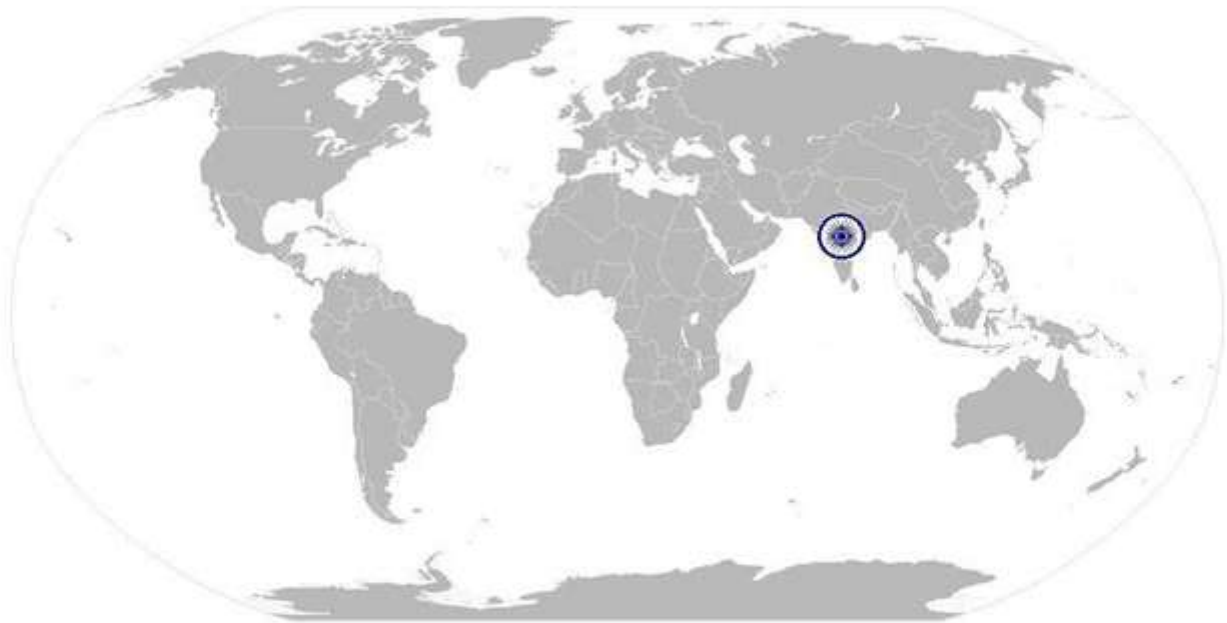
Qualification pack code	Qualification pack code is a unique reference code that identifies a qualification pack.
Resistive Temperature Detector	Temperature sensors made of metals, especially Platinum, that have a very predictable dependence of resistivity with temperature.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with, carrying out the function which has a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operation having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub Sector	Sub sector is derived from a further breakdown based on the characteristics and interests of its components.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Thermocouple	A kind of temperature detector based on Seebeck Effect, which depends on an EMF being developed when dissimilar materials form junctions and a temperature differential exists between the junctions. The value of the generated EMF depends on material properties and temperature differential between the two junctions.
Traceability	Ability to correlate calibration of equipment to national and international standards - ultimately to secondary and primary standards.
Unit Code	Unit code is a unique identifier for an 'OS' unit which can be denoted with either 'O' or 'N'.
Unit title	Unit title gives clear overall statement about what the incumbent should be able to do.

Acronyms

Keywords /Terms	Description
PM	Preventive Maintenance
RTD	Resistive Temperature Detectors
TC	Thermocouple
SOP	Standard Operating Procedures
UUC	Unit Under Calibration

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National Occupational Standard



Overview

This unit is about maintaining Readiness and Usability of Thermal Calibration setup at regular intervals.

IAS/N0200

Work Place Readiness - Calibration

National Occupational Standard

Unit Code	IAS/N0200
Unit title (Task)	Work Place Readiness - Calibration
Description	The OS unit is about maintaining system Readiness, usability and Safety considerations at the workplace as mandated by the organization. The individual follows organization specified handling methods and keeps the calibration equipment and setup in good order.
Scope	<p>The Scope includes:</p> <ul style="list-style-type: none"> • Maintain Workplace Readiness • Ensure Lighting Environment norms • Maintain Workplace Environment and Safety
Performance Criteria (PC) with respect to the scope	
Element	Performance Criteria
Maintain Workplace Readiness	<p>To be competent, the individual must be able to:</p> <p>PC1. Perform Workplace Checks as prescribed by the organizational norms which includes:</p> <ul style="list-style-type: none"> • Cleanliness of work area and equipment • Completeness of calibration setup • Uncluttered workplace <p>The checks are performed in all areas in which UUCs are calibrated. The individual notes any deviation and reports to supervisor.</p> <p>PC2. Handle equipment in recommended and safe manner</p> <ul style="list-style-type: none"> • Uses hand gloves of specified material for handling the UUC so that these are not soiled. • Follows prescribed precautions while handling hot objects (such as temperature bath, furnace, sensors and probes)
Ensure Lighting Environment norms	<p>PC3. Check for lighting / associated electricals at Thermal Calibration Installation. Report any deviations to electrical department.</p> <ul style="list-style-type: none"> • Check for adequate lighting near Thermal Calibration installations • Check for temporary/unsafe electrical wiring
Maintain Workplace	PC4. Check for the operating temperature of work area and confirm that it is

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Work Place Readiness - Calibration

<p>Environment and Safety</p>	<p>within the specified limits for Calibration Installation</p> <ul style="list-style-type: none"> • Check that the air conditioning and ventilation systems are operating • Check that the environment temperature is within the specified limits for the precision equipment such as Digital Multimeter or Calibrator <p>PC5. Ensure that hot objects such as Thermocouples, RTDs are put inside appropriate stands or enclosures provided after removing from the hot furnace so that no accidental contact can be made and burning is avoided.</p> <p>PC6. Use appropriate gloves while handling hot objects.</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational context (Knowledge of the company / organization and its process relevant to areas of responsibilities)</p>	<p>KA1. Understands the requirements of maintaining environment and cleanliness of the workplace for Calibration operation and how it impacts the organization process and business.</p> <ul style="list-style-type: none"> • Understands the role of calibration in the organization (whether part of the end user Production and Quality Assurance process or of a calibration service provider) • Understands the impact of calibration quality on the company business
<p>B. Technical Knowledge</p>	<p>KB1. The Calibration Technician knows and understands Thermal Calibration process and its impact on calibration accuracy, which includes:</p> <ul style="list-style-type: none"> • How incorrect use of temperature bath, reference probes and other measuring equipment affects the integrity of the measurement • How incorrect setting of temperature bath and measuring equipment affects the integrity of the measurement • Need for cleaning of the UUC leads in certain cases (for example for thermocouples with flying leads or thermocouple materials) before any measurement • Need for annealing of the UUC in certain cases before calibration measurement • Need for stabilization of the system before taking measurement • Difference between a single point and multipoint calibration process • Importance of proper connection before taking measurements.
<p>Skill(S)</p>	
<p>A. Core Skills / Generic Skills</p>	<p>Writing skills</p> <p>The individual on the job needs to know and understand how to:</p> <p>SA1. Use Formats and check list for Site Hygiene</p> <p>SA2. Write emails and messages about site related issues</p> <p>Reading Skills</p>

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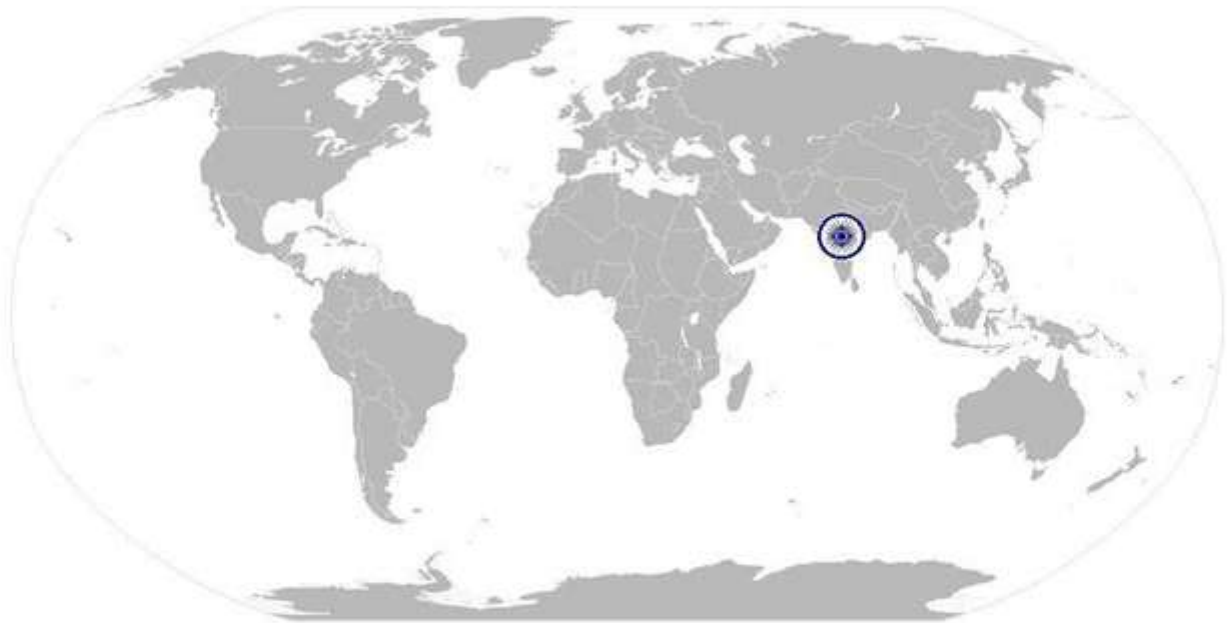
Work Place Readiness - Calibration

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. Read product literature and manuals relevant for the job</p> <p>SA4. Read the company information about working practices at the site</p> <p>SA5. Read the information displayed at the workplace</p>
	<p>Oral Communication (Listening and Speaking skills)</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Describe site conditions and issues to co-workers and supervisor</p> <p>SA7. Communicate to the management in meetings about site hygiene issues to get their support</p> <p>SA8. Interact with coworkers and gather information related to process and site conditions</p>
B. Professional Skills	<p>Decision Making</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SB1. Make decisions pertaining to the concerned area of work</p>
	<p>Plan and Organize</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SB2. Prioritize daily activities for the upkeep of calibration operation through ensuring availability of the calibration setup and its components.</p>
	<p>Customer Centricity</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Understand real needs of the customer and suggest most appropriate solution</p> <p>SB4. Support customer when they need help</p>
	<p>Problem Solving</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s)</p> <p>SB6. Identify immediate or temporary solutions to resolve delays</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. Use the existing information to arrive at actionable decision points</p> <p>SB8. Use the existing information for improving the customer satisfaction</p>
	<p>Critical Thinking</p>

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Work Place Readiness - Calibration

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action</p> <p>SB10. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization</p>
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Work Place Readiness - Calibration

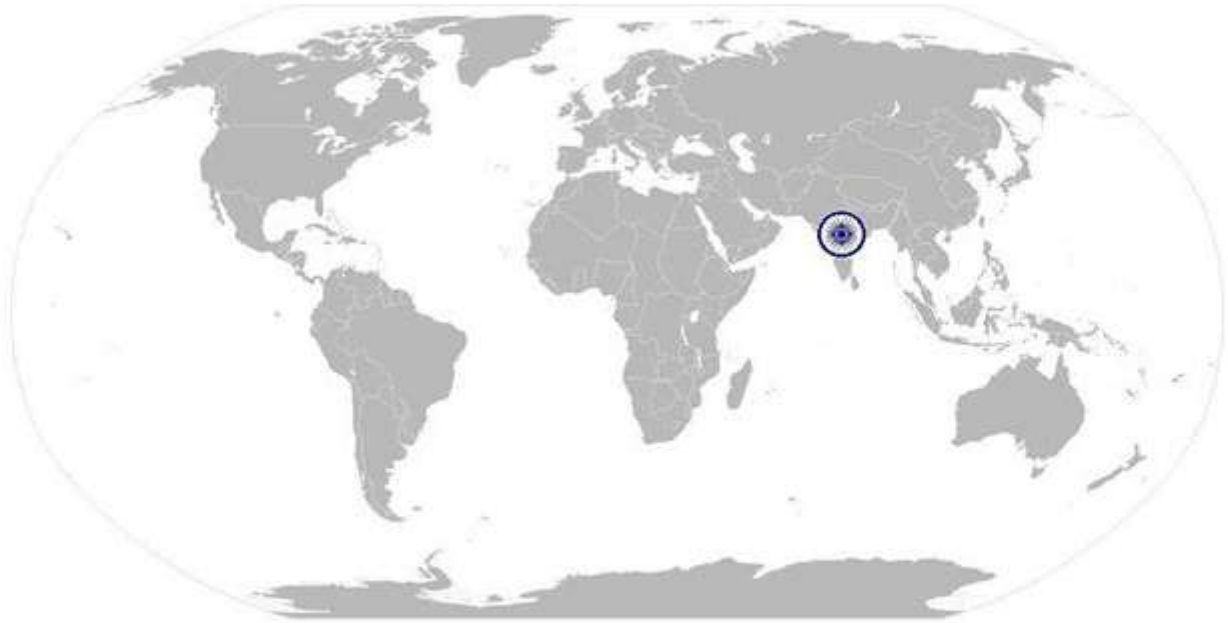
NOS Version Control

NOS Code	IAS/N0200		
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Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
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Occupation	Testing & Calibration	Next review date	30/07/2019



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National Occupational Standard



Overview

This unit is about calibration of Thermocouples according to the Standard Operating Procedures (SOP) of the organization.

IAS/N0201

Calibration of Thermocouple

National Occupational Standard	Unit Code	IAS/N0201
	Unit title (Task)	Calibration of Thermocouple
	Description	The OS unit is about calibration of Thermocouples according to the SOP of the organization
	Scope	<p>The Scope relates to:</p> <ul style="list-style-type: none"> • Pre Calibration steps • Perform Measurements • Post Processing, Recording and Communication of results
	Performance Criteria (PC) with respect to the scope	
	Element	Performance Criteria
	Perform Pre Calibration steps	<p>The individual must be able to perform pre calibration steps that ensure that the intended calibration can be performed with the available setup and that the setup and the Unit Under Calibration (UUC) are ready for measurements according to organization SOP.</p> <p>PC1. Verify UUC type to be calibrated</p> <ul style="list-style-type: none"> • Verify whether the UUC is Thermocouple element, Encapsulate Thermocouple, Indicator, Analogue Transmitter or Digital Transmitter. Appropriate calibration procedure is to be selected as mandated by the organization SOP. • Verify if it is a batch calibration, if so, verify the size of the batch and the capacity of the calibrator for accommodating thermocouples. • Verify the identity of the UUC (thermocouple type, serial number, other markings etc.) and match it with the work order. • Verify the type of calibration to be performed on the UUC - (mV vs. Temperature in case of Thermocouple element (covered under standards for Electro-Technical Calibration) or Temperature comparison of UUC vs. Reference TC and Indicator) <p>PC2. Prepare UUC and the setup for calibration, according to organization SOP.</p> <ul style="list-style-type: none"> • Clean the body of the UUC and the leads (for bare lead elements) • Verify the continuity and integrity of the UUC (by continuity check or reading the room temperature on the indicator) • OPTIONAL: Anneal THE UUC at specified temperature for specified time, as specified in SOP

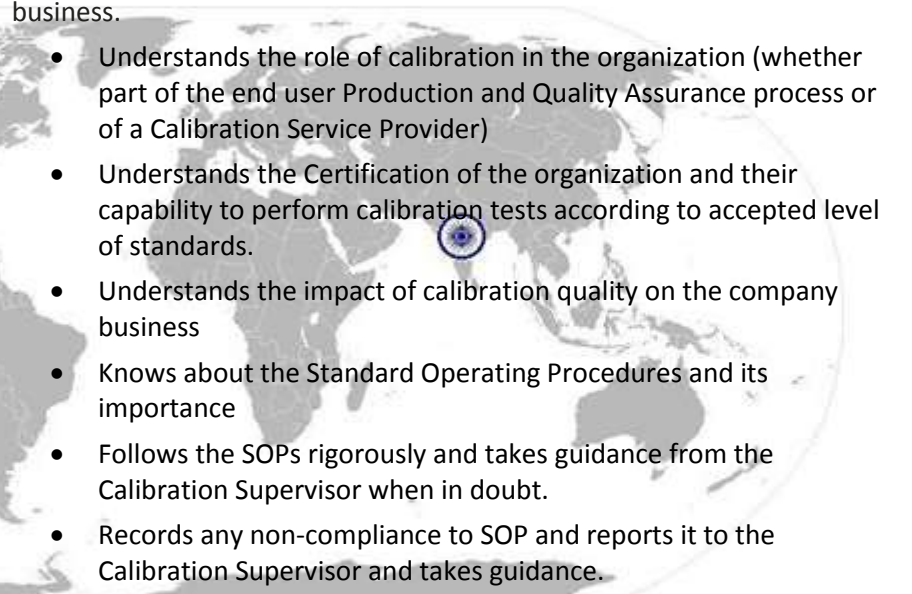
IAS/N0201

Calibration of Thermocouple

	<ul style="list-style-type: none"> • Select temperature bath and temperature range • Set the start temperature for the temperature bath • Start heating of the bath. Allow it to ramp and soak for the time specified in SOP • Determine the number of measurement points according to SOP • Select the measurement range(s) for the digital meters <p>PC3. Place and connect UUC in the setup</p> <ul style="list-style-type: none"> • Place the UUC (one or more) in the temperature bath • Connect these to measurement setup, as specified in SOP • Allow the UUC (one or more) time to attain the temperature of the bath
<p>Perform Measurements</p>	<p>The individual must be able to perform measurement steps according to organization SOP.</p> <p>PC4. Perform and record measurements.</p> <ul style="list-style-type: none"> • Read the appropriate devices for the UUC and the Reference temperature. • Record the readings in the logbook or other specified document and format • Repeat the measurements at the same temperature a number of times as specified in SOP • Change the setting of the bath temperature to the next point and let the bath temperature stabilize • Perform and record measurements the specified number of times, repeating steps (b) and (c) above. • Repeat the steps (d) and (e) till all temperature points are covered. The bath would be at the highest temperature of the measurement range. • Repeat the multipoint measurements ramping down, or as specified in the SOP. <p>PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.</p> <ul style="list-style-type: none"> • If no other calibration is to be performed for the day, shut down the setup per organization SOP.
<p>Perform Post Processing, Recording and communication of results</p>	<p>The individual must be able to perform post measurement processing steps to derive the calibration results from the measurement data, as specified in the SOP. The processing may be manual or using any software as specified. The result must be stored and communicated to the designated individuals, per SOP.</p> <p>PC6. Process measurement data for derived parameters</p> <ul style="list-style-type: none"> • Perform statistical processing - average, standard deviation, min,

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Calibration of Thermocouple

	<p>max at each measurement point as specified in the SOP</p> <ul style="list-style-type: none"> • Determine Uncertainty of measurement as specified in the SOP • Document results in formats as specified in the SOP <p>PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.</p> <ul style="list-style-type: none"> • Save the measurement data and results in prescribed format on prescribed media • Report job completion or failure to the supervisor per SOP
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational context (Knowledge of the company / organization and its process relevant to areas of responsibilities)</p>	<p>KA1. Understands the requirements of performing Thermocouple Calibration operation and how it impacts the organization process and business.</p> <ul style="list-style-type: none"> • Understands the role of calibration in the organization (whether part of the end user Production and Quality Assurance process or of a Calibration Service Provider) • Understands the Certification of the organization and their capability to perform calibration tests according to accepted level of standards. • Understands the impact of calibration quality on the company business • Knows about the Standard Operating Procedures and its importance • Follows the SOPs rigorously and takes guidance from the Calibration Supervisor when in doubt. • Records any non-compliance to SOP and reports it to the Calibration Supervisor and takes guidance. 
<p>B. Technical Knowledge</p>	<p>KB1. The Calibration Technician knows and understands how thermocouples work and how Thermocouple Calibration is performed. The individual also knows about the sources of errors in the calibration process, how these are avoided and its impact on calibration accuracy: The individual should be familiar with:</p> <ul style="list-style-type: none"> • What is Calibration • Why is calibration needed • What are the types of calibration - Primary, Secondary, Tertiary • Traceability of the calibration of instruments performing the tests • What are Thermocouples • Types of Thermocouples, measurement ranges and application • Color codes for Thermocouples • Compensating leads and its function

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Calibration of Thermocouple

	<ul style="list-style-type: none"> • Thermocouple Connectors • Thermocouple measurement principle • Cold Junction Compensation • Thermocouple Calibration, generic procedure • Types of Calibration • Sources of inaccuracies in Thermocouple measurements and how to avoid / minimize these • Equipment needed for Thermocouple Calibration • Deriving calibration results - data processing and interpretation
Skill(S)	
A. Core Skills / Generic Skills	Writing skills
	The individual on the job needs to know and understand how to: SA1. Use Formats and check list for Thermocouple calibration and reports SA2. Write emails and messages about calibration related issues
	Reading Skills
	The individual on the job needs to read and understand: SA3. Company policy related to Thermocouple calibration SA4. Terminology, symbols, codes, standards and common practices related to thermocouples SA5. Terminology, data processing steps and reporting of results related to thermocouple calibration. SA6. Formats and check list for Thermocouple Calibration
	Oral Communication (Listening and Speaking skills)
	The individual on the job needs to know and understand how to: SA7. Communicate with the Calibration Supervisor for task scheduling, task reporting and exception reporting SA8. Communicate to the management in meetings about process or equipment issues which need management attention
B. Professional Skills	Decision Making
	The individual on the job needs to know and understand how to: SB1. Make decisions about what calibration to perform and consult Supervisor if needed
	Plan and Organize
	The individual on the job needs to know and understand how to: SB2. Prioritize daily tasks and batches of calibration efficiently and effectively to meet client and company needs

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Calibration of Thermocouple

	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Understand real needs of the customer and suggest most appropriate solution SB4. Support customer when they need help
	Problem Solving
	The individual on the job needs to know and understand how to: SB5. Diagnose reasons for any down time in the calibration setup SB6. Identify immediate or temporary solutions to resolve delays and discuss with the Supervisor
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB7. Use the existing information to arrive at actionable decision points SB8. Use the existing information for improving the customer satisfaction
	Critical Thinking
The user/individual on the job needs to know and understand how to: SB9. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action SB10. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization	



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Calibration of Thermocouple

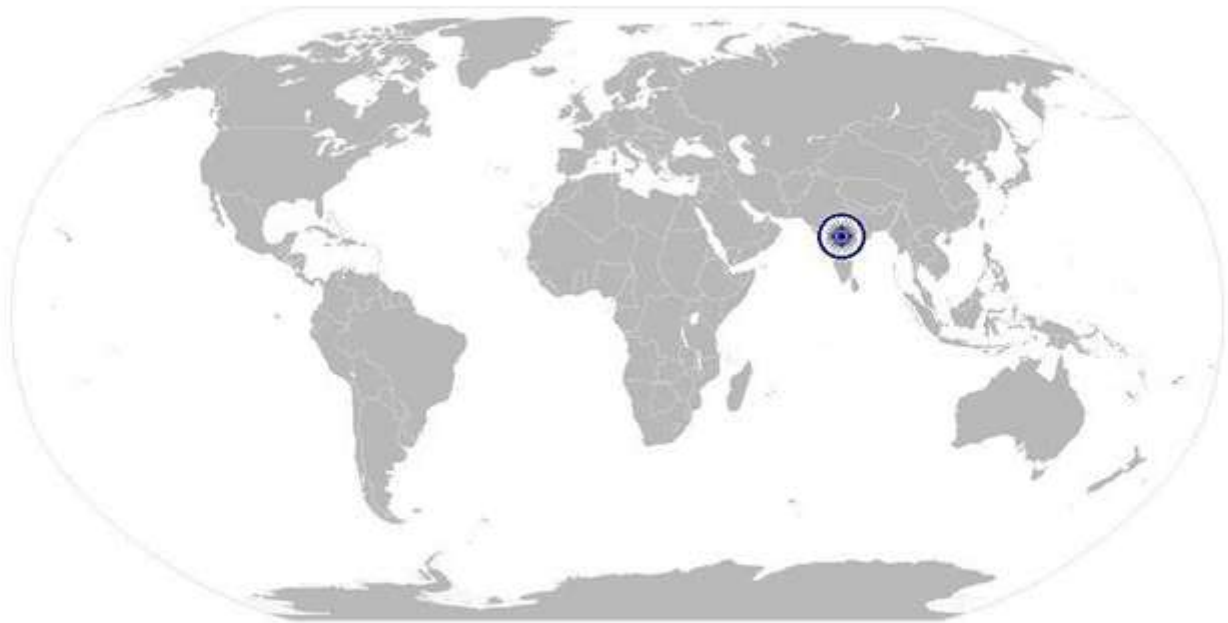
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National Occupational Standard



Overview

This unit is about calibration of RTDs according to the Standard Operating Procedures (SOP) of the organization.

IAS/N0202

Calibration of RTD

National Occupational Standard

Unit Code	IAS/N0202
Unit title (Task)	Calibration of RTD
Description	The OS unit is about calibration of RTDs according to the SOP of the organization
Scope	<p>The Scope relates to</p> <ul style="list-style-type: none"> • Pre Calibration Steps • Perform Measurements • Post Processing and communication of results
Performance Criteria (PC) with respect to the scope	
Element	Performance Criteria
Perform Pre Calibration steps	<p>The individual must be able to perform pre calibration steps that ensure that the intended calibration can be performed with the available setup and that the setup and the Unit Under Calibration (UUC) are ready for measurements according to organization SOP.</p> <p>PC1. Verify UUC type to be calibrated</p> <ul style="list-style-type: none"> • Verify whether the UUC is RTD element, Encapsulate RTD, Indicator, Analogue Transmitter or Digital Transmitter. Appropriate calibration procedure is to be selected as mandated by the organization SOP. • Verify if it is a batch calibration, if so, verify the size of the batch and the capacity of the calibrator for accommodating RTDs. • Verify the identity of the UUC (RTD type, serial number, other markings etc.) and match it with the work order. • Verify the type of calibration to be performed on the UUC - (mV vs. Temperature in case of RTD element (covered under standards for Electro-Technical Calibration) or Temperature comparison of UUC vs. Reference TC and Indicator) <p>PC2. Prepare the UUC and the calibration setup, according to organization SOP.</p> <ul style="list-style-type: none"> • Clean the body of the UUC and the leads (for bare lead elements) • Verify the continuity and integrity of the UUC (by continuity check or reading the room temperature on the indicator) • OPTIONAL: Anneal the UUC at specified temperature for specified time, as specified in SOP • Select temperature bath and temperature range • Set the start temperature for the temperature bath • Start heating of the bath. Allow it to ramp and soak for the time specified in SOP • Determine the number of measurement points according to SOP and

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Calibration of RTD

	<p>noting these values in the measurement logbook for use during the measurements</p> <ul style="list-style-type: none"> • Select the measurement range(s) for the digital meters <p>PC3. Place and connect UUC in the setup</p> <ul style="list-style-type: none"> • Place the UUC (one or more) in the temperature bath • Connect these to measurement setup, as specified in SOP • Allow the UUC (one or more) time to attain the temperature of the bath
<p>Perform Measurements</p>	<p>The individual must be able to perform measurement steps according to organization SOP.</p> <p>PC4. Perform and record measurements.</p> <ul style="list-style-type: none"> • Read the appropriate devices for the UUC and the Reference temperature. • Record the readings in logbook or other specified document and format • Repeat the measurements at the same temperature a number of times as specified in SOP • Change the setting of the bath temperature to the next point and let the bath temperature stabilize • Perform and record measurements the specified number of times, repeating steps (b) and (c) above. • Repeat the steps (d) and (e) till all temperature points are covered. The bath would be at the highest temperature of the measurement range. • Repeat the multipoint measurements ramping down, or as specified in the SOP. <p>PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.</p> <ul style="list-style-type: none"> • If no other calibration is to be performed for the day, shut down the setup per organization SOP.
<p>Perform Post Processing and communication of results</p>	<p>The individual must be able to perform post measurement processing steps to derive the calibration results from the measurement data, as specified in the SOP. The processing may be manual or using any software as specified. The result must be stored and communicated to the designated individuals, per SOP.</p> <p>PC6. Process measurement data for derived parameters</p> <ul style="list-style-type: none"> • Perform statistical processing - average, standard deviation, min, max at each measurement point as specified in the SOP • Determine Uncertainty of measurement as specified in the SOP • Document results as specified in the SOP <p>PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.</p>

IAS/N0202

Calibration of RTD

Knowledge and Understanding (K)	
<p>A. Organizational context (Knowledge of the company / organization and its process relevant to areas of responsibilities)</p>	<p>KA1. Understands the requirements of performing RTD Calibration operation and how it impacts the organization process and business.</p> <ul style="list-style-type: none"> • Understands the role of calibration in the organization (whether part of the end user Production and Quality Assurance process or of a Calibration Service Provider) • Understands the Certification of the organization and their capability to perform calibration tests according to accepted level of standards. • Understands the impact of calibration quality on the company business • Knows about the Standard Operating Procedures and its importance • Follows the SOPs rigorously and takes guidance from the Calibration Supervisor when in doubt. • Records any non-compliance to SOP and reports it to the Calibration Supervisor and takes guidance.
<p>B. Technical Knowledge</p>	<p>KB1. The Calibration Technician knows and understands how RTDs work and how RTD Calibration is performed. The individual also knows about the sources of errors in the calibration process, how these are avoided and its impact on calibration accuracy:</p> <p>The individual should be familiar with:</p> <ul style="list-style-type: none"> • What is Calibration • Why is calibration needed • What are the types of calibration - Primary, Secondary, Tertiary • Traceability of the calibration of instruments performing the tests. Different organizations delivering calibration services are certified for their capability to perform tests according to accepted level of standards. • What are RTDs • Types of RTDs, measurement ranges and application • Color codes for RTDs • RTD Connectors • RTD measurement principles - 3 and 4 wires • RTD Calibration generic procedure • Types of Calibration • Sources of inaccuracies in RTD measurements • Equipment needed for RTD Calibration • Deriving calibration results - data processing and interpretation
Skill(S)	
<p>A. Core Skills / Generic Skills</p>	<p>Writing skills</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SA1. Use Formats and check list for RTD calibration and reports</p> <p>SA2. Write emails and messages about calibration related issues</p>

IAS/N0202

Calibration of RTD

	Reading Skills
	The individual on the job needs to read and understand: SA3. Company policy related to RTD calibration SA4. Terminology, symbols, codes, standards and common practices related to RTDs SA5. Terminology, data processing steps and reporting of results related to RTD calibration. SA6. Formats and check list for RTD Calibration
	Oral Communication (Listening and Speaking skills)
	The individual on the job needs to know and understand how to: SA7. Communicate with the Calibration Supervisor for task scheduling, task reporting and exception reporting SA8. Communicate to the management in meetings about process or equipment issues which need management attention
B. Professional Skills	Decision Making
	The individual on the job needs to know and understand how to: SB1. Make decisions about what calibration to perform and consult Supervisor if needed
	Plan and Organize
	The individual on the job needs to know and understand how to: SB2. Prioritize daily tasks and batches of calibration efficiently and effectively to meet client and company needs
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Understand real needs of the customer and suggest most appropriate solution
	Problem Solving
	The individual on the job needs to know and understand how to: SB4. Diagnose reasons for any down time in the calibration setup SB5. Identify immediate or temporary solutions to resolve delays and discuss with the Supervisor
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. Use the existing information to arrive at actionable decision points SB7. Use the existing information for improving the customer satisfaction
Critical Thinking	
The user/individual on the job needs to know and understand how to: SB8. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action	

IAS/N0202

Calibration of RTD

	SB9. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization
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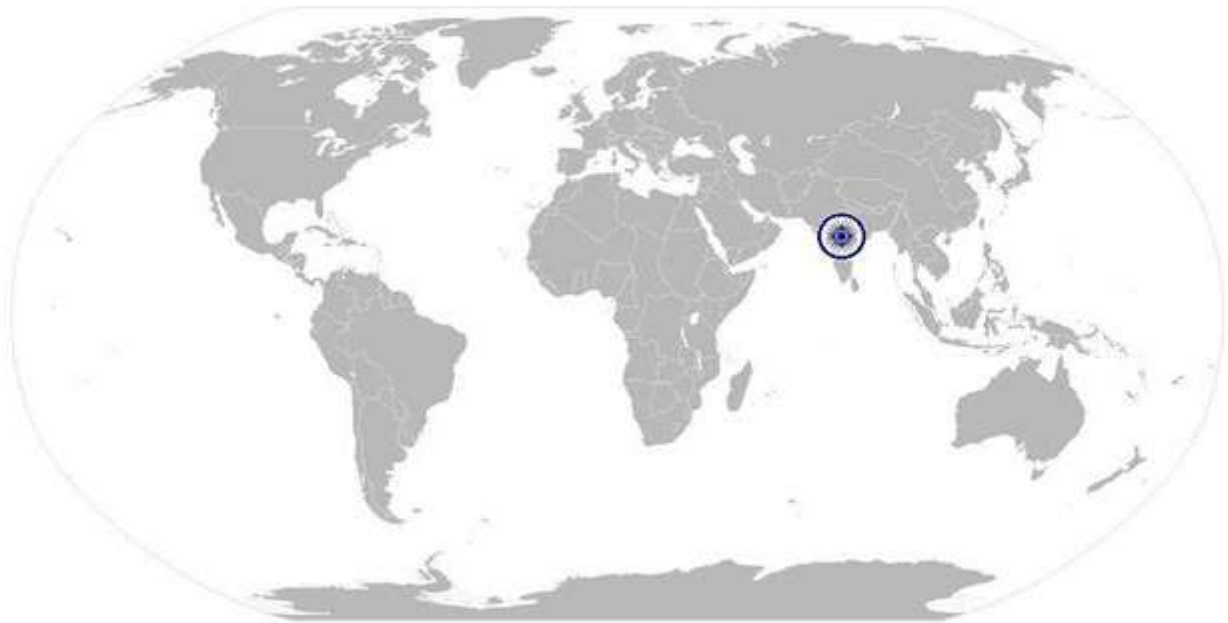
NOS Version Control

NOS Code	IAS/N0202		
Credits(NSQF)	TBD	Version number	1.0
Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
Sub-sector	Instrumentation	Last reviewed on	30/07/2016
Occupation	Testing & Calibration	Next review date	30/07/2019



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National Occupational Standard



Overview

This unit is about calibration of Infrared / Non Contact Temperature Detector Calibration according to the Standard Operating Procedures (SOP) of the organization.

IAS/N0203

Calibration of Infrared / Noncontact Temperature Detector

National Occupational Standard

Unit Code	IAS/N0203
Unit title (Task)	Calibration of Infrared / Non Contact Temperature Detector
Description	The OS unit is about calibration of Infrared / Non Contact Temperature Detector according to the SOP of the organization
Scope	<p>The Scope relates to:</p> <ul style="list-style-type: none"> • Pre Calibration Steps • Perform Measurements • Post Processing and communication of results
Performance Criteria (PC) with respect to the scope	
Element	Performance Criteria
Perform Pre Calibration steps	<p>The individual must be able to perform pre calibration steps that ensure that the intended calibration can be performed with the available setup and that the setup and the Unit Under Calibration (UUC) are ready for measurements according to organization SOP.</p> <p>PC1. Verify UUC type to be calibrated</p> <ul style="list-style-type: none"> • Verify whether the UUC is a Handheld Infrared Detector with Display, Analogue Transmitter or Digital Transmitter. Appropriate calibration procedure is to be selected as mandated by the organization SOP. • Verify the identity of the UUC (sensor type, serial number, other markings etc.) and match it with the work order. • Verify the type of calibration to be performed on the UUC <p>PC2. Preparation of UUC and the setup for calibration, according to organization SOP.</p> <ul style="list-style-type: none"> • Verify the integrity of the UUC (for example, by reading the room temperature on the indicator) • Select the Black Body Radiation Source and range • Set the start temperature for the Black Body source • Start heating of the source. Allow it to ramp and soak for the time specified in SOP • Determine the number of measurement points according to SOP and noting these values in the measurement logbook for use during the measurements • Select the measurement range(s) for the digital meters <p>PC3. Position and connect UUC in the setup</p>

IAS/N0203

Calibration of Infrared / Noncontact Temperature Detector

	<ul style="list-style-type: none"> • Mount / Position the UUC in the temperature setup to face the Black Body Source at specified distance and orientation • Connect it to the measurement setup, as specified in SOP • Allow the UUC time to attain the temperature of the bath
<p>Perform Measurements</p>	<p>The individual must be able to perform measurement steps according to organization SOP.</p> <p>PC4. Perform and record measurements.</p> <ul style="list-style-type: none"> • Read the UUC and the Reference temperature. • Record the readings in the specified document and format • Repeat the measurements at the same temperature a number of times as specified in SOP • Change the setting of the Black Body Source to the next point and let the Black Body Source stabilize • Perform and record measurements the specified number of times, repeating steps (b) and (c) above. • Repeat the steps (d) and (e) till all temperature points are covered. The bath would be at the highest temperature of the measurement range. • Repeat the multipoint measurements ramping down, or as specified in the SOP. <p>PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.</p> <ul style="list-style-type: none"> • If no other calibration is to be performed for the day, shut down the setup per organization SOP.
<p>Perform Post Processing and communication of results</p>	<p>The individual must be able to perform post measurement processing steps to derive the calibration results from the measurement data, as specified in the SOP. The processing may be manual or using any software as specified. The result must be stored and communicated to the designated individuals, per SOP.</p> <p>PC6. Process measurement data for derived parameters</p> <ul style="list-style-type: none"> • Perform statistical processing - average, standard deviation, min, max at each measurement point as specified in the SOP • Determine Uncertainty of measurement as specified in the SOP • Document results as specified in the SOP <p>PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.</p>
<p>Knowledge and Understanding</p>	

IAS/N0203 Calibration of Infrared / Noncontact Temperature Detector

<p>A. Organizational context (Knowledge of the company / organization and its process relevant to areas of responsibilities)</p>	<p>KA1. Understands the requirements of performing Infrared Sensor Calibration operation and how it impacts the organization process and business.</p> <ul style="list-style-type: none"> • Understands the role of calibration in the organization (whether part of the end user Production and Quality Assurance process or of a Calibration Service Provider) • Understands the Certification of the organization and their capability to perform calibration tests according to accepted level of standards. • Understands the impact of calibration quality on the company business • Knows about the Standard Operating Procedures and its importance • Follows the SOPs rigorously and takes guidance from the Calibration Supervisor when in doubt. • Records any non-compliance to SOP and reports it to the Calibration Supervisor and takes guidance.
<p>B. Technical Knowledge</p>	<p>KB1. The Calibration Technician knows and understands how Infrared sensor work and how bath temperature Calibration is performed. The individual also knows about the sources of errors in the calibration process, how these are avoided and its impact on calibration accuracy:</p> <p>The individual should be familiar with:</p> <ul style="list-style-type: none"> • What is Calibration • Why is calibration needed • What are the types of calibration - Primary, Secondary, Tertiary • Traceability of the calibration of instruments performing the tests. Different organizations delivering calibration services are certified for their capability to perform tests according to accepted level of standards. • What are Infrared / Noncontact sensors • Black Body Radiation Sources • Types of Infrared sensors, measurement ranges and application • Infrared measurement principles • Infrared sensor Calibration generic procedure • Types of Calibration • Sources of inaccuracies in Infrared sensor measurements • Equipment needed for Infrared sensor Calibration • Calibration results - data processing and interpretation
<p>Skill(S)</p>	
<p>A. Core Skills / Generic Skills</p>	<p>Writing skills</p> <p>The individual on the job needs to know and understand how to:</p> <p>SA1. Use Formats and check list for Infrared Sensors calibration and reports</p> <p>SA2. Write emails and messages about calibration related issues</p> <p>Reading Skills</p>

IAS/N0203

Calibration of Infrared / Noncontact Temperature Detector

	<p>The individual on the job needs to read and understand:</p> <p>SA3. Company policy related to Infrared Sensors calibration</p> <p>SA4. Terminology, symbols, codes, standards and common practices related to Infrared Sensors</p> <p>SA5. Terminology, data processing steps and reporting of results related to Infrared Sensors calibration.</p> <p>SA6. Formats and check list for Infrared Sensors Calibration</p>
	<p>Oral Communication (Listening and Speaking skills)</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SA7. Communicate with the Calibration Supervisor for task scheduling, task reporting and exception reporting</p> <p>SA8. Communicate to the management in meetings about process or equipment issues which need management attention</p>
B. Professional Skills	<p>Decision Making</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SB1. Make decisions about what calibration to perform and consult Supervisor if needed</p>
	<p>Plan and Organize</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SB2. Prioritize daily tasks and batches of calibration efficiently and effectively to meet client and company needs</p>
	<p>Customer Centricity</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Understand real needs of the customer and suggest most appropriate solution</p>
	<p>Problem Solving</p>
	<p>The individual on the job needs to know and understand how to:</p> <p>SB4. Diagnose reasons for any down time in the calibration setup</p> <p>SB5. Identify immediate or temporary solutions to resolve delays and discuss with the Supervisor</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. Use the existing information to arrive at actionable decision points</p> <p>SB7. Use the existing information for improving the customer satisfaction</p>
<p>Critical Thinking</p>	
<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action</p> <p>SB9. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization</p>	

IAS/N0203 Calibration of Infrared / Noncontact Temperature Detector

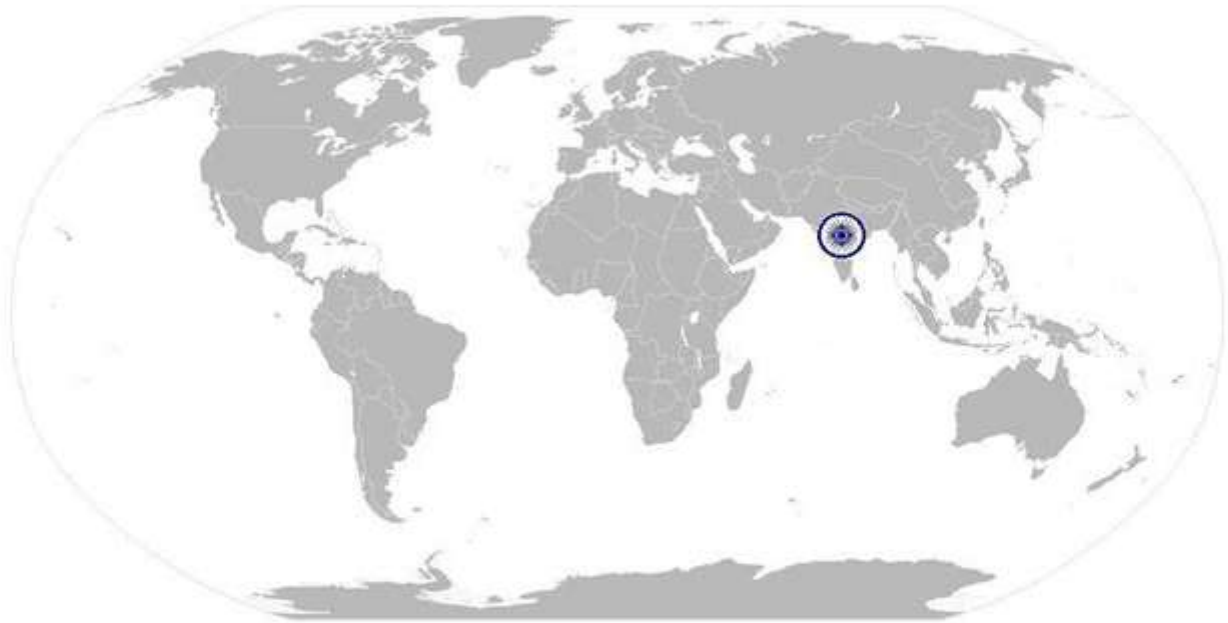
NOS Version Control

NOS Code	IAS/N0203		
Credits(NSQF)	TBD	Version number	1.0
Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
Sub-sector	Instrumentation	Last reviewed on	30/07/2016
Occupation	Testing & Calibration	Next review date	30/07/2019



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National Occupational Standard



Overview

This unit is about reporting and record keeping of calibration processes as per company processes.

IAS/N0204

Task Reporting - Calibration

National Occupational Standard	Unit Code	IAS/N0204
	Unit title task	Task Reporting-Calibration
	Description	The OS unit is about reporting and record keeping as per company processes and job description for Calibration Technician - Thermal
	Scope	<p>This Unit Task covers performing the following:</p> <ul style="list-style-type: none"> • Task Reporting - Normal • Task reporting - faults • Task reporting - PM • Task reporting – unusual occurrence • Task reporting - theft • Task reporting – security breach
	Performance Criteria (PC) with respect to the scope:	
	Element	Performance Criteria
	Perform Task reporting-normal	<p>PC1. Report completed task per organization process.</p> <ul style="list-style-type: none"> • Record the completed task in log book or other document as defined by the SOP
	Perform Task reporting-faults	PC2. Report faults/issues to immediate supervisor
	Perform Task reporting - PM	PC3. Perform entry of preventive maintenance check lists/reports
	Perform Task reporting-unusual occurrence	PC4. Report on noticing any visible changes in of thermal calibration setup or its accessories. Report for immediate attention of supervisor
Perform Task reporting-theft	PC5. Report any theft in thermal calibration setup to supervisor	
Perform Task reporting-security breach	PC6. Report suspicious movement of new persons near of thermal calibration setup to security and supervisor	
Knowledge and Understanding (K)		
(A) Organizational context (Knowledge of the company organization and its process relevant to area of responsibilities)	KA1. Understands how Thermal Calibration is performed in the organization and the impact of it on the business.	

IAS/N0204

Task Reporting - Calibration

<p>(B) Technical Knowledge</p>	<p>The individual has the knowledge and understanding to be:</p> <p>KB1. Able to write daily log and failure reports</p> <p>KB2. Able to furnish basic data to supervisor related to specifications of thermal calibration setup</p> <p>KB3. Able to send internal mails related to supervisor or co-workers</p> <p>KB4. Familiar with basic computer work to type simple reports and use of e-mail. Records Maintenance history</p>
<p>Skill(s)</p>	
<p>A. Core Skills / Generic Skills</p>	<p>Writing skills</p> <p>The individual on the job needs to know and understand how to:</p> <p>SA1. Use Formats and check list for calibration and reports</p> <p>SA2. Write emails and messages about calibration related issues</p> <p>Reading Skills</p> <p>The individual on the job needs to read and understand:</p> <p>SA3. Company policy related to calibration and reporting</p> <p>SA4. Formats and check list for Calibration</p> <p>SA5. Terminology, symbols, codes, standards and common practices related to sensors that are calibrated</p> <p>SA6. Terminology, data processing steps and reporting process</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The individual on the job needs to know and understand how to:</p> <p>SA7. Communicate issue / fault with complete details to the supervisor</p> <p>SA8. Communicate with the Calibration Supervisor for task scheduling, task reporting and exception reporting</p> <p>SA9. Communicate to the management in meetings about process or equipment issues which need management attention</p>
<p>B. Professional Skills</p>	<p>Decision Making</p> <p>The individual on the job needs to know and understand:</p> <p>SB1. What data is to be recorded</p> <p>SB2. What reports are to be made</p> <p>Plan and Organize</p> <p>The individual on the job needs to know and understand how to:</p> <p>SB3. Prioritize and schedule reporting tasks</p> <p>SB4. Cooperates with his/her team and offers assistance on a regular basis</p> <p>SB5. Communicate with the Calibration Supervisor for task scheduling, task reporting and exception reporting</p>

IAS/N0204

Task Reporting - Calibration

	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. Understand real needs of the customer and suggest most appropriate solution
	Problem Solving
	The individual on the job needs to know and understand how to: SB7. Investigate reasons for any anomalous report and correct it
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Use the existing information to arrive at actionable decision points SB9. Use the existing information for improving the customer satisfaction
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action SB11. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization



IAS/N0204

Task Reporting - Calibration

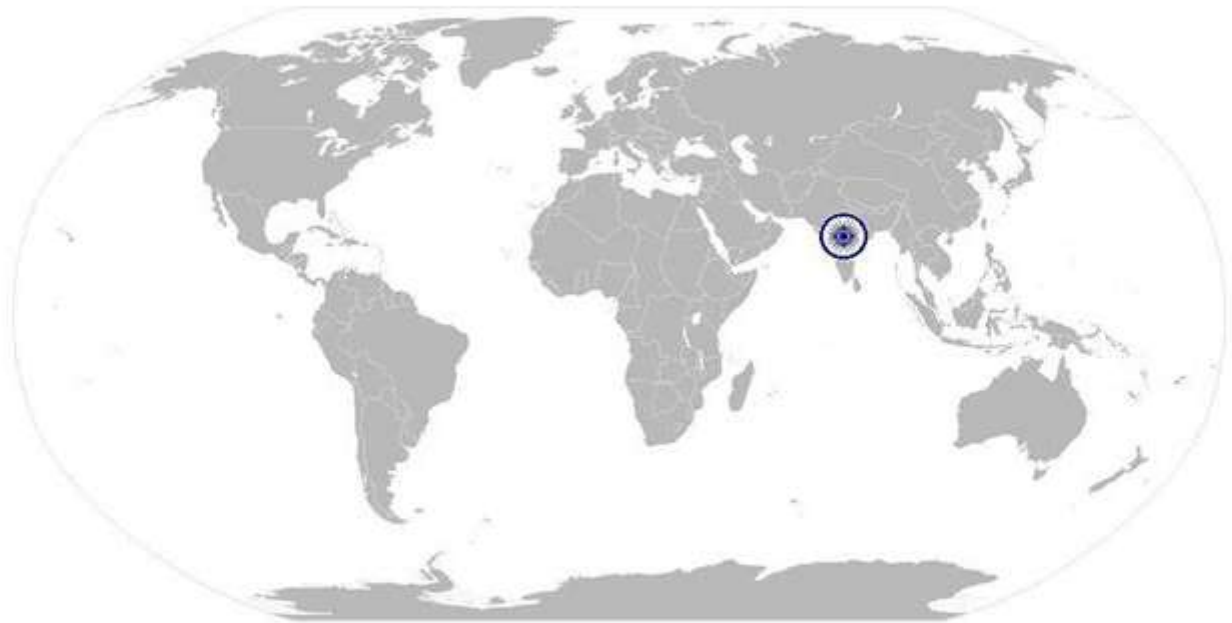
NOS Version Control

NOS Code	IAS/N0204		
Credits(NSQF)	TBD	Version number	1.0
Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
Sub-sector	Instrumentation	Last reviewed on	30/07/2016
Occupation	Testing & Calibration	Next review date	30/07/2019



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National Occupational Standard



Overview

The unit is about conducting regular Preventive Maintenance activities of Thermal Calibration setup.

IAS/N0205

Preventive Maintenance - Thermal Calibration

National Occupational Standard

Unit Code	IAS/N0205
Unit title task	Preventive Maintenance – Thermal Calibration
Description	The OS unit is about performing Preventive maintenance for Thermal Calibration setup.
Scope	This Unit Task covers the following : <ul style="list-style-type: none"> • PM- Visual checks and action • PM – completion of preventive maintenance schedule
Performance Criteria (PC) with respect to the scope:	
Element	Performance Criteria
Perform PM-Visual Checks and action	The individual on the job needs to be able to: PC1. Carry out Visual Checks and perform prescribed action wherever possible, using SOP of the organization for system health check. <ul style="list-style-type: none"> • Check temperature baths for proper operation over its range. • Check calibration meters for proper operation over its range. • Check electrical continuity of reference probes (thermocouples, RTDs, Radiation Detector) • Check electrical performance of reference probes (thermocouples, RTDs, Radiation Detector) using recommended procedure
Perform PM-completion of preventive maintenance schedule.	The individual on the job needs to be able to: PC2. Complete preventive maintenance schedule list of thermal calibration setup and accessories. Close any issues in the list.
Knowledge and Understanding	
A. Organizational context (Knowledge of the company organization and its process relevant to area of responsibilities)	Needs to know and understand : KA1. PM norms as defined by the company KA2. Production targets and production loss figures for the month and contribution of Thermal calibration towards it. KA3. Maintenance Policy of the company with respect to Thermal Calibration strategy
B. Technical Knowledge	Needs to Know and understand: KB1. Trouble Shooting of:

IAS/N0205

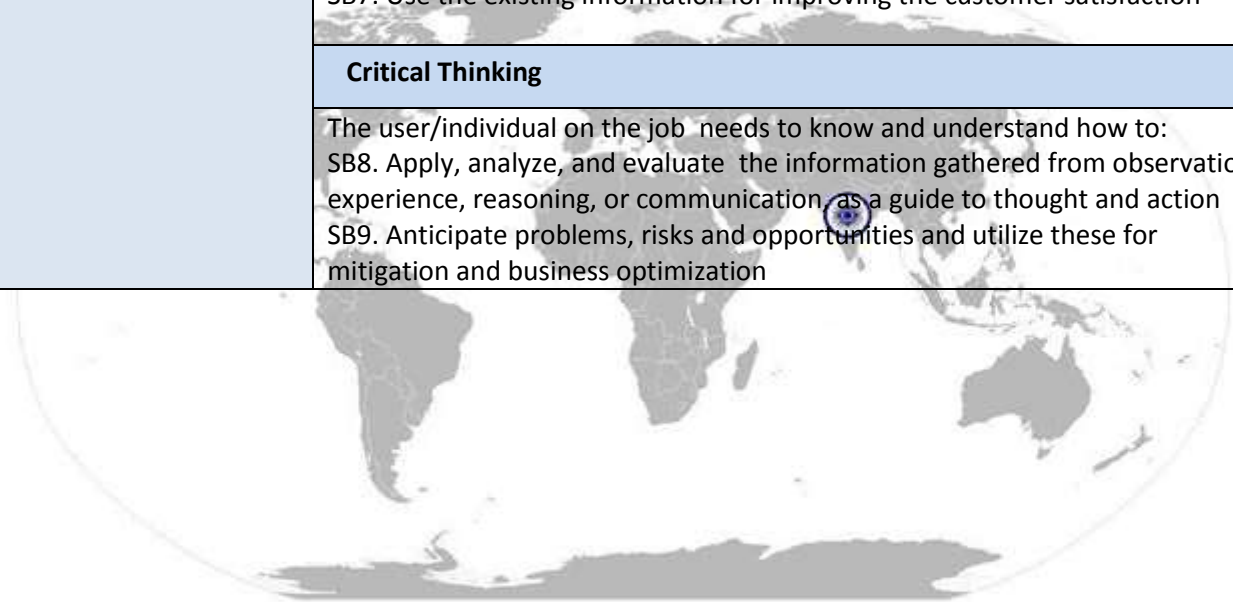
Preventive Maintenance - Thermal Calibration

	<ul style="list-style-type: none"> • Temperature bath and furnace • Reference Thermocouple • Reference RTD • Digital Meters • Indicators • Interconnecting cables and connectors • Blackbody source <p>KB2. Use of Calibration Manuals when required</p>
Skill(s)	
A. Core Skills / Generic Skills	Writing skills
	<p>The individual on the job needs to know how to:</p> <p>SA1. Use Formats and check list for Preventive Maintenance planning and reports</p> <p>SA2. Write emails and messages about maintenance related issues</p>
	Reading Skills
	<p>The individual on the job needs to know read and understand:</p> <p>SA3. Company policy related to Preventive Maintenance</p> <p>SA4. Down time in terms of production loss</p> <p>SA5. Formats for Preventive Maintenance check sheets</p>
	Oral Communication (Listening and Speaking skills)
	<p>The individual on the job needs to know and understand how to:</p> <p>SA6. Describe condition of control valves and accessories and issues to co-workers and supervisor</p> <p>SA7. Communicate to the management in meetings about maintenance issues which need management attention</p> <p>SA8. Interact with coworkers and gather information related to process and control valve conditions</p>
B. Professional Skills	Decision Making
	<p>The individual on the job needs to know and understand how to:</p> <p>SB1. Make decisions about timing and extent of preventive maintenance, in consultation with the Supervisor</p>
	Plan and Organize
	<p>The individual on the job needs to know and understand how to:</p> <p>SB2. Prioritize daily tasks to conduct Preventive Maintenance effectively</p>
	Customer Centricity

IAS/N0205

Preventive Maintenance - Thermal Calibration

	<p>The user/individual on the job needs to know and understand how to: SB3. Understand real needs of the customer and suggest most appropriate solution</p>
	<p>Problem Solving</p>
	<p>The individual on the job needs to know and understand how to: SB4. Diagnoses reasons for down time due to calibration setup failure SB5. Identify immediate or temporary solutions to resolve delays and discuss with the Supervisor</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to: SB6. Use the existing information to arrive at actionable decision points SB7. Use the existing information for improving the customer satisfaction</p>
	<p>Critical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to: SB8. Apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action SB9. Anticipate problems, risks and opportunities and utilize these for mitigation and business optimization</p>



IAS/N0205

Preventive Maintenance - Thermal Calibration

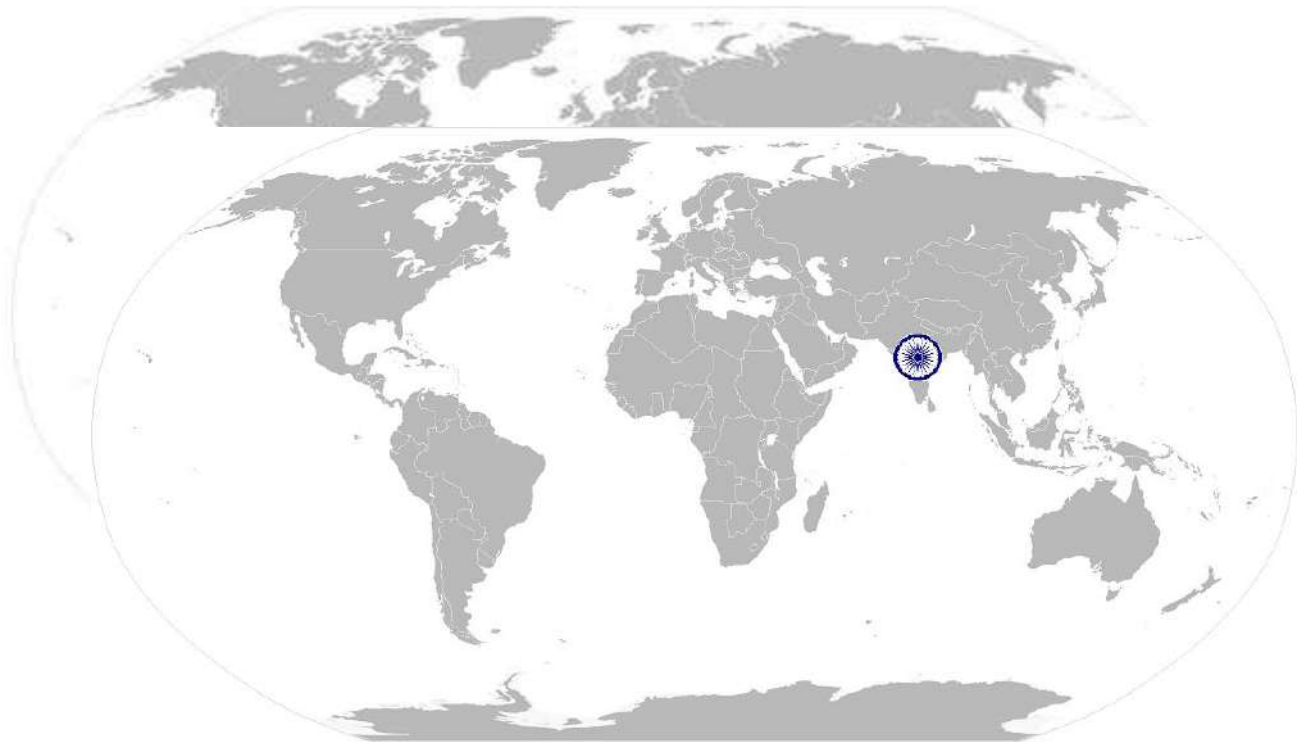
NOS Version Control

NOS Code	IAS/N0205		
Credits(NSQF)	TBD	Version number	1.0
Sector	Instrumentation, Automation Surveillance and Communication	Drafted on	30/07/2016
Sub-sector	Instrumentation	Last reviewed on	30/07/2016
Occupation	Testing & Calibration	Next review date	30/07/2019



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National Occupational Standard



Overview

This unit is about working effectively with colleagues, in own work group and in other work groups within the organization.

IAS/N2105

Work Effectively With Teams

National Occupational Standard	Unit Code	IAS/N2105
	Unit Title (Task)	Work Effectively With Teams
	Description	This NOS unit is about building relationships and working with people and groups inside and outside the organization, using skills and habits, to achieve the team goals and objectives.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Creating team environment • Communicating - giving and receiving • Working cooperatively • Participating in team decision making • Demonstrating Sense of Responsibility • Showing respect for opinions, customs and preferences
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
Create Team Environment	<p>To be competent, the individual on the job must be able to:</p> <p>PC1. Know and understand the team objectives and goals</p> <p>PC2. Know team members by name. Greet them appropriately and respond to their greetings.</p> <p>PC3. Know the roles and responsibilities of team members. Ensure others know about you and your role in the team</p> <p>PC4. Learn about the culture and preferences of team members – especially if they belong to other organizations or nationalities</p> <p>PC5. Follow organization’s policies and procedures for working with team members within and outside the organization – especially relating to privacy, confidentiality and security.</p> <p>PC6. Create an environment of trust and mutual respect</p>	

IAS/N2105

Work Effectively With Teams

<p>Communicate – Give and Receive</p>	<p>To be competent, the individual on the job must be able to:</p> <p>PC7. Use appropriate mode of communication – verbal, written, mail, phone or text and clearly articulate your message to ensure that the recipient understands the message.</p> <p>PC8. Listen to team members and try to understand what they are wanting to say. Seek or provide clarifications if you see any gap in understanding</p> <p>PC9. Communicate professionally and follow organization protocols. Do not overload the team members with unnecessary and unsolicited information</p> <p>PC10. Share important information with the team timely.</p> <p>PC11. Respond to communications promptly.</p>
<p>Work Cooperatively</p>	<p>To be competent, the individual on the job must be able to:</p> <p>PC12. Perform own role and produce output in time for other team members to consume</p> <p>PC13. Receive inputs from others and work upon it per role requirement</p> <p>PC14. Make adjustments within the permissible rules so that work flows smoothly.</p> <p>PC15. Help team members to perform their role effectively and provide any clarifications and support they need</p> <p>PC16. Share tools and common resources fairly, taking cognizance of others’ needs and schedules</p> <p>PC17. Resolve any contentious issues amicably, involving the team lead or the supervisor if needed</p> <p>PC18. Let team members know in good time if you cannot carry out your commitments, explaining the reasons and alternate solutions, if any. Let the team lead know about this.</p>
<p>Participate in Team Decision making</p>	<p>To be competent, the individual on the job must be able to:</p> <p>PC19. Think positively and make constructive suggestions to meet the goals</p> <p>PC20. Accept and give suggestions with open mind</p> <p>PC21. Take initiatives and volunteer to contribute</p> <p>PC22. Help team members with facts and figures to arrive at workable decisions</p> <p>PC23. Accept decisions professionally and support these, even if these do not match your suggestions and personal views</p>
<p>Demonstrate Sense of Responsibility</p>	<p>To be competent, the individual on the job must be able to:</p> <p>PC24. Act in the interest of the team and the organization to ensure that things do not ‘fall through the gap’ and team goals are achieved.</p> <p>PC25. Take initiative to correct the situation if something seems to be going wrong.</p> <p>PC26. Seek help or escalate if the situation demands</p>

IAS/N2105

Work Effectively With Teams

<p>Show Respect for Opinions, Customs and Preferences</p>	<p>To be competent, the individual on the job must be able to:</p> <p>PC27. Follow organization’s and statutory guidelines about making references or comments to social customs or preferences</p> <p>PC28. Refrain from making any comments to hurt sentiments</p> <p>PC29. Accommodate team members’ preferences to the extent feasible. If these come in the way of fulfilling team goals, discuss with the supervisor/ team leader.</p> <p>PC30. Seek information and clarifications from others if you do not understand any customs.</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The organization’s policies and procedures for working with colleagues, roles and responsibilities in relation to this</p> <p>KA2. The importance of effective communication and establishing good working relationships with colleagues</p> <p>KA3. Different methods of communication and the circumstances in which it is appropriate to use these</p> <p>KA4. The importance of creating an environment of trust and mutual respect</p> <p>KA5. The implications of own work on the work and schedule of others</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Different types of information that colleagues might need and the importance of providing this information when it is required</p> <p>KB2. The importance of helping colleagues with problems, in order to meet quality and time standards as a team</p>
<p>Skills (S) [Optional]</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job need to know and understand how to:</p> <p>SA1. Complete written work with attention to detail</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. Read instructions, guidelines/procedures</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. Listen effectively and orally communicate information</p> <p>SA4. Ask for clarification and advice from the concerned person</p>
<p>B. Professional Skills</p>	<p>Decision Making</p>

IAS/N2105

Work Effectively With Teams

	The user/individual on the job needs to know and understand how to: SB1. Make decisions on a suitable course of action or response keeping in view resource utilization while meeting commitments
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Plan and organize work to achieve targets and deadlines
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Understand real needs of the customer and suggest most appropriate solution SB4. Support customer when they need help
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB5. Apply problem solving approaches in different situations
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. Use the existing information to arrive at actionable decision points SB7. Use the existing information for improving the customer satisfaction SB8. Use the existing information to optimize solution and company business SB9. Analyze problems and identify causes and possible solutions
	Critical Thinking
The user/individual on the job needs to know and understand how to: SB10. Apply balanced judgments to different situations	

IAS/N2105

Work Effectively With Teams

NOS Version Control

NOS Code	IAS/N2105		
Credits(NSQF)	TBD	Version number	1.0
Industry	Instrumentation Automation Surveillance & Communication	Drafted on	30/07/2016
Industry Sub-sector	Instrumentation	Last reviewed on	30/07/2016
Occupation	Testing and Calibration	Next review date	30/07/2019



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Qualifications Pack For Calibration Technician (Thermal)

Annexure

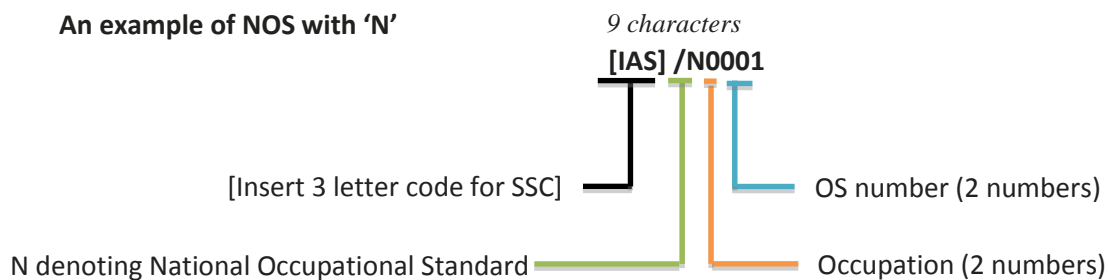
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Installation and Commissioning	00-29
Operation and Maintenance	30-49
Calibration	50-55
Design, Fabrication / Manufacturing	56-79
Design, Fabrication, Installation & Commissioning	80-89
General	90-99

Sequence	Description	Example
Three letters	Industry name	IAS
Slash	/	/
Next letter	Whether QP or NOS	Q
Next two numbers	Occupation code	01
Next two numbers	OS number	01

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CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Qualifications Pack- Calibration Technician (Thermal)

Qualification Pack IAS/Q5001

Sector Skill Council Instrumentation Automation Surveillance & Communication

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be approved by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions approved by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack , every trainee should score minimum 70 % marks for each NOS as prescribed by the SSC
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

Assessment Outcomes	Assessment Criteria for Outcomes	Marks Allocation			
		Total Marks (60+100+100+100+60+75)	Out of	Theory	Skills Practical
1: IAS/N0200 Work Place Readiness - Calibration	PC1. Perform Workplace Checks as prescribed by Organizational norms which includes: Cleanliness of work area and equipment, Completeness of calibration setup and an uncluttered workplace.	60	10	5	5
	PC2. Handle equipment in a manner that is recommended and safe.		10	4	6
	PC3. Check for lighting / associated electricals at Calibration Installation. Report any deviations to electrical department.		10	2	8
	PC4. Check for the operating temperature of the work area and confirm that it is within the specified limits for the Calibration Installation		10	2	8
	PC5. Ensure that hot objects such as Thermocouples, RTDs are put inside appropriate stands or enclosures provided after		10	2	8

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	removing from the hot furnace so that no accidental contact can be made and burning is avoided.				
	PC6. Use appropriate gloves while handling hot objects.		10	2	8
		Total	60	17	43
2. IAS/N 0201 Calibration of Thermocouple	PC1. Verify UUC type to be calibrated	100	10	5	5
	PC2. Preparation of UUC and the setup for calibration, according to organization SOP.		10	5	5
	PC3. Place and connect UUC in the setup		5	2	3
	PC4. Perform and record measurements.		40	10	30
	PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.		5	2	3
	PC6. Process measurement data for derived parameters		20	10	10
	PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.		10	4	6
		Total	100	38	62
3. IAS/N 0202 Calibration of RTD	PC1. Verify UUC type to be calibrated	100	10	5	5
	PC2. Preparation of UUC and the setup for calibration, according to organization SOP.		10	5	5
	PC3. Place and connect UUC in the setup		5	2	
	PC4. Perform and record measurements.		40	10	30
	PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.		5	2	3
	PC6. Process measurement data for derived parameters		20	10	10
	PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.		10	4	6
		Total	100	38	62
4. IAS/N 0203 Calibration of Infrared / Non contact Temperature Detector	PC1. Verify UUC type to be calibrated	100	10	5	5
	PC2. Preparation of UUC and the setup for calibration, according to organization SOP.		10	5	5
	PC3. Position and connect UUC in the setup		5	2	3
	PC4. Perform and record measurements.		40	10	30
	PC5. Setup the system for next calibration batch / operation, as given in the job schedule by the supervisor.		5	2	3
	PC6. Process measurement data for derived parameters		20	10	10
	PC7. Store the results and communicate it to the supervisor and other recipients as specified in the SOP.		10	4	6
		Total	100	38	62
5. IAS/N 0204 Task Reporting- Calibration	PC1. Report completed task per organization process.	100	20	10	10
	PC2. Report faults/issues to immediate supervisor		20	5	15
	PC3. Perform entry of preventive maintenance check lists/reports		20	10	10

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	PC4. Report on noticing any visible changes in of thermal calibration setup or its accessories. Report for immediate attention of supervisor		20	5	15
	PC5. Report any theft in thermal calibration setup to supervisor		10	5	5
	PC6. Report suspicious movement of new persons near of thermal calibration setup to security and supervisor		10	5	5
		Total	100	40	60
6. IAS/N 0205 Preventive Maintenance-Calibration	PC1. Carry out Visual Checks and perform prescribed action wherever possible, using SOP of the organization for system health check.	60	30	10	20
	PC2. Complete preventive maintenance schedule list of thermal calibration setup and accessories. Close any issues in the list.		30	10	20
		Total	60	20	40
7. IAS/N2105 Work Effectively With Teams	PC1. Know and understand the team objectives and goals	75	3	1	2
	PC2. Know team members by name. Greet them appropriately and respond to their greetings.		2	1	1
	PC3. Know the roles and responsibilities of team members. Ensure others know about you and your role in the team		2	1	1
	PC4. Learn about the culture and preferences of team members – especially if they belong to other organizations or nationalities		5	1	4
	PC5. Follow organization’s policies and procedures for working with team members within and outside the organization – especially relating to privacy, confidentiality and security.		2	1	1
	PC6. Create an environment of trust and mutual respect		3	1	2
	PC7. Use appropriate mode of communication – verbal, written, mail, phone or text and clearly articulate your message to ensure that the recipient understands the message.		2	1	1
	PC8. Listen to team members and try to understand what they are wanting to say. Seek or provide clarifications if you see any gap in understanding		3	1	2
	PC9. Communicate professionally and follow organization protocols. Do not overload the team members with unnecessary and unsolicited information		4	1	3
	PC10. Share important information with the team timely.		3	1	2
	PC11. Respond to communications promptly.		3	1	2
	PC12. Perform own role and produce output in time for other team members to consume		3	1	2
	PC13. Receive inputs from others and work upon it per role requirement		2	1	1

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PC14. Make adjustments within the permissible rules so that work flows smoothly.	2	1	1
PC15. Help team members to perform their role effectively and provide any clarifications and support they need	2	1	1
PC16. Share tools and common resources fairly, taking cognizance of others' needs and schedules	2	1	1
PC17. Resolve any contentious issues amicably, involving the team lead or the supervisor if needed	2	1	1
PC18. Let team members know in good time if you cannot carry out your commitments, explaining the reasons and alternate solutions, if any. Let the team lead know about this.	2	1	1
PC19. Think positively and make constructive suggestions to meet the goals	2	1	1
PC20. Accept and give suggestions with open mind	2	1	1
PC21. Take initiatives and volunteer to contribute	2	1	1
PC22. Help team members with facts and figures to arrive at workable decisions	2	1	1
PC23. Accept decisions professionally and support these, even if these do not match your suggestions and personal views	4	1	3
PC24. Act in the interest of the team and the organization to ensure that things do not 'fall through the gap' and team goals are achieved.	4	1	3
PC25. Take initiative to correct the situation if something seems to be going wrong.	2	1	1
PC26. Seek help or escalate if the situation demands	2	1	1
PC27. Follow organization's and statutory guidelines about making references or comments to social customs or preferences	2	1	1
PC28. Refrain from making any comments to hurt sentiments	2	1	1
PC29. Accommodate team members' preferences to the extent feasible. If these come in the way of fulfilling team goals, discuss with the supervisor/ team leader.	2	1	1
PC30. Seek information and clarifications from others if you do not understand any customs.	2	1	1
Total	75	30	45

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