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APPROVED TRAINING ORGANISATION

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NASA 307

Radiographic Testing Curriculum

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Revision control sheet:

Rev No:	Date:	Compiled by:	Reviewed by:	Revision Description:
0	08-Jan-2019	Miechaal Sewcoomar	Nishaan Kanhaye	Implemented into QMS.
1	02-Apr-2025	Acacia Sureschandra	Nishaan Kanhaye	The document format was updated.

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1.0 Course Duration:

1.1 Level 1:

a) The minimum training hours administered in Level 1 shall be 40.

1.2 Level 2:

a) The minimum training hours administered in Level 2 shall be 120.

2.0 Course Content:

2.1 Theory: The table below shows theory aspects covered:

Chapter Reference:	Level 1 and 2:
Chapter 1:	Introduction Terminology History Advantages and Limitations of Industrial Radiography
Chapter 2:	Properties of X and Gamma Rays Electro-Magnetic Radiation
Chapter 3:	Electro-Magnetic Radiation Wavelength (λ) Frequency (Hz) Velocity (m/s)
Chapter 4:	Absorption Scatter Rayleigh scattering
Chapter 5:	Production of X-Rays Circuits for X-rays Production Self-rectification Full wave rectified AC Fully rectified Tube Linear Accelerations (Linac), High Energy Machine and Betatrons Betatron Gamma Ray Sources Atom Particulate Radiation Electromagnetic Radiation Properties of Gamma Rays Production of X and Gamma Rays

Chapter 6:	<ul style="list-style-type: none"> X-ray Film Density Characteristic Curve Characteristic (H & D) Curve Contrast and Latitude Film Speed Intensifying screens Fluorescent (Salt) Screens Metal Screens Fluorometallic Screens Real Time (Fluoroscopic) System
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Chapter 7:	<ul style="list-style-type: none"> Film Processing Automatic Processing Film Processing Faults
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Chapter 8:	<ul style="list-style-type: none"> Sensitivity Factors affecting sensitivity Subject Contrast Film Contrast Geometric Factors Formula for Geometric Unsharpness Graininess Factors Film Inherent Unsharpness (U_f) The Inverse Square Law The Reciprocity Law Safety Formula Exposure Calculation Formula
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Chapter 9:	<ul style="list-style-type: none"> Measurement of Exposure and Sensitivity Exposure Chart X-rays Radiographic Sensitivity Wire Image Quality Indicators EN462-1 Wire IQI Step Hole Plaque Type IQI Step (Plaque)/Hole American IQIs (Penetrameter)
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Chapter 10:	<ul style="list-style-type: none"> Isotopes used in Radiography
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Chapter 11:	Calculation Information for Radiography Exposure Reciprocity Law Inverse Square Law Exposure varies directly as the square of the distance Geometric Unsharpness Radiographic Sensitivity Intensity at 1m from 1 GBq Tenth/half value Layers (mm) Density Conversion Chart
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Note: Level 2 requires a deeper knowledge of the content mentioned above.

2.2 Practical: The table below shows practical aspects covered:

Level 1:	Level 2:
X and Gamma radiography of welds (light and dense alloys) in accordance to written instructions. Film handling and processing. Pre-test Checks (Calibrate and verify test equipment). Assess and use safety equipment, radiation meters and monitors. Report the results of Radiographic tests.	X and Gamma radiography of welds (light and dense alloys) in accordance to codes and standards. Film handling, selection and processing. Define the limitations of the test method. Compile techniques in accordance to codes / standards. Pre-test Checks (Calibrate and verify test equipment). Assess and use safety equipment, radiation meters and monitors. Interpretation and evaluation according to codes, specifications or procedures. Report the results of Radiographic tests.

3.0 Learning outcomes:

3.1 Upon completion of training, students should be able to carry out and / or understand the following regarding Radiographic Testing:

Level 1	Level 2
Basic principles. General advantages and limitations. Discontinuity associated with manufacturing processes, categories and types. Carry out pre-test checks, set up equipment and perform tests in accordance to written instructions. Reporting of results.	Basic principles. General advantages and limitations. Discontinuity associated with manufacturing processes, categories and types. Select test technique to be used. Interpret codes, specifications and procedures. Compile instructions according to specifications, codes or procedures. Carry out pre-test checks, set up equipment, perform tests and report results. Interpret and evaluate test results according to specifications, codes or procedures.

4.0 Course Outcome:

4.1 Successful Completion of Training:

Upon successful completion of the course, a successful completion of training certificate at the level attempted will be issued which meets eligibility to undertake the external PCN examination.

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