

Supervisor R&D Testing

QP Code: ASC/Q6502

NSQF Level: 5

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Qualification Pack

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ASC/Q6502: Supervisor R&D Testing

Brief Job Description

Individuals at this job need to be responsible for the indoor testing and validation activities in R&D for developing final products conforming to the customer requirements.

Personal Attributes

This job requires the individual to be able to coordinate internally and externally within the organization. The individual should be result oriented and possess strong observation & interpretation skills. The individual should also be able to demonstrate skills for mathematical reasoning, customer orientation, lateral thinking and communication.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ASC/N0006: Maintain a safe and healthy working environment](#)
2. [ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area](#)
3. [ASC/N6508: Perform testing and validation of prototype](#)
4. [ASC/N6509: Monitor R&D lab testing activities](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Testing and Validation
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0101

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Minimum Educational Qualification & Experience	<p>Certificate (ASDC Level 4 design or testing) with 10-15 Years of experience in R&D department</p> <p>OR</p> <p>Certificate (ASDC Level 4 design or testing) with 10-15 Years of experience in R&D department</p> <p>OR</p> <p>Certificate (ASDC Level 4 design or testing) with 0-6 Months of experience Not applicable</p>
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	<p>Compulsory: PLM database application, NA Lab View software for lab testing, stress analysis techniques ,testing and validation techniques like FEA, product/components testing methods Bench & Vehicle, knowledge of TS16949/ISO14001/EMS systems Voluntary: Information flow systems like ERP/SAP</p>
Minimum Job Entry Age	18 Years
Last Reviewed On	27/09/2013
Next Review Date	31/03/2020
NSQC Approval Date	20/07/2015
Version	1.0

Qualification Pack

ASC/N0006: Maintain a safe and healthy working environment

Description

This NOS is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner and training team members on health and safety related issues

Scope

The role holder will be responsible for

- identifying and reporting of risks
- creating and sustaining a safe, clean and environment friendly work place This NOS will be applicable to all Automotive sector manufacturing job roles

Elements and Performance Criteria

Identify and report the risks identified

To be competent, the user/individual on the job must be able to:

- PC1..** Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise
- PC2.** Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc
- PC3.** Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations
- PC4.** Create awareness amongst other by sharing information on the identified risks

Create and sustain a Safe, clean and environment friendly work place

To be competent, the user/individual on the job must be able to:

- PC5..** Follow the instructions given on the equipment manual describing the operating process of the equipments
- PC6..** Follow the Safety, Health and Environment related practices developed by the organization
- PC7.** Operate the machine using the recommended Personal Protective Equipments (PPE)
- PC8. .** Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc
- PC9.** Maintain high standards of personal hygiene at the work place
- PC10.** Ensure that the waste disposal is done in the designated area and manner as per organization SOP.
- PC11.** Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

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- KU1.** relevant standards, procedures and policies related to Health, Safety and Environment followed in the company
- KU2.** basic knowledge of Safety procedures(fire fighting, first aid) within the organization
- KU3.** knowledge of various types of PPEs and their usage
- KU4.** basic knowledge of risks/hazards associated with each occupation in the organization
- KU5.** how to safely operate various tools and machines and risks associated with the tools/ equipment
- KU6.** knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** write basic level notes and observations
- GS2.** read safety instructions put up across the plant premises
- GS3.** read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
- GS4.** effectively communicate information to team members
- GS5.** inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.
- GS6.** question operator/ supervisor in order to understand the safety related issues
- GS7.** attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs
- GS8.** use common sense and make judgments during day to day basis
- GS9.** use reasoning skills to identify and resolve basic problems
- GS10.** use common sense and make judgments during day to day basis
- GS11.** use reasoning skills to identify and resolve basic problems

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify and report the risks identified</i>	8	23	-	-
PC1.. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	3	6	-	-
PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc	2	6	-	-
PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	6	-	-
PC4. Create awareness amongst other by sharing information on the identified risks	1	5	-	-
<i>Create and sustain a Safe, clean and environment friendly work place</i>	17	52	-	-
PC5.. Follow the instructions given on the equipment manual describing the operating process of the equipments	3	7	-	-
PC6.. Follow the Safety, Health and Environment related practices developed by the organization	3	8	-	-
PC7. Operate the machine using the recommended Personal Protective Equipments (PPE)	3	8	-	-
PC8. . Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc	2	8	-	-
PC9. Maintain high standards of personal hygiene at the work place	2	7	-	-
PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	3	8	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others	1	6	-	-
NOS Total	25	75	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0006
NOS Name	Maintain a safe and healthy working environment
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	20/07/2015

Qualification Pack

ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area

Description

This NOS is about overseeing the implementation of all 5 S activities both at the shop floor and the office area by the team members and training the team in implementation of the 5S principles

Scope

The individual needs to

- Ensure sorting, streamlining/ organizing, storage and documentation, systematic cleaning, standardization and sustenance across the plant and office premises of the organization as given in the organization guidelines

Elements and Performance Criteria

Ensure proper sorting of items at the work place

To be competent, the user/individual on the job must be able to:

- PC1..** ensure all recyclable materials are put in designated containers
- PC2.** ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use
- PC3.** ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions
- PC4.** ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins
- PC5..** segregate the items which are labelled at red tag items for the process area and keep them in the correct places
- PC6..** ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions
- PC7.** check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area
- PC8. .** oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material
- PC9.** ensure that areas of material storage areas are not overflowing
- PC10.** ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required

Ensure proper documentation and storage streamlining & organizing the workplace

To be competent, the user/individual on the job must be able to:

- PC11.** ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc

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- PC12.** make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions
- PC13.** ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .

Ensure cleaning of self and the work place

To be competent, the user/individual on the job must be able to:

- PC14.** ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards
- PC15..** ensure workbenches and work surfaces are clean and in good condition
- PC16..** ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination
- PC17..** ensure all recyclable materials are put in designated containers

Ensure standardization

To be competent, the user/individual on the job must be able to:

- PC18.** ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant
- PC19..** ensure all recyclable materials are put in designated containers
- PC20. .** ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes
- PC21.** ensure timely creation and sharing of the 5s checklists
- PC22.** ensure that the 5s manual are available as per the timelines

Ensure sustenance

To be competent, the user/individual on the job must be able to:

- PC23.** ensure team cooperation during the audit of 5 s activities
- PC24.** ensure that workmen are periodically trained to address challenges related to 5s
- PC25..** participate actively in employee work groups on 5s and encourage team members for active participation
- PC26..** oversee that the staff/operators are trained and fully understand 5s procedures
- PC27. .** ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable
- PC28.** ensure continuous training of the team members on 5s in order to increase their awareness and support implementation
- PC29.** ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards, procedures and policies related to 5S followed in the company
- KU2.** have basic knowledge of 5S procedures
- KU3.** know various types 5s practices followed in various areas

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- KU4.** understand the 5S checklists provided in the department/ team
- KU5.** have skills to identify useful & non useful items
- KU6.** have knowledge of labels , signs & colours used as indicators
- KU7.** Have knowledge on how to sort and store various types of tools,equipment, material etc
- KU8.** know , how to identify various types of waste products
- KU9.** understand the impact of waste/ dirt/ dust/unwantedsubstances on the process/ environment/ machinery/ humanbody
- KU10.** have knowledge of best and environment protective ways ofcleaning & waste disposal
- KU11.** understand the importance of standardization in processes
- KU12.** understand the importance of sustainability in 5S
- KU13.** have knowledge of TQM process
- KU14.** have knowledge of various materials and storage norms
- KU15.** understand visual controls, symbols, graphs etc

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** write basic level notes and observations
- GS2.** note down observations (if any) related to the process
- GS3.** write information documents to internal departments/ internal teams
- GS4.** read 5S instructions put up across the plant premises
- GS5.** effectively communicate information to team members inform employees in the plant and concerned functions about 5S
- GS6.** question the process head in order to understand the 5S related issues
- GS7.** attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
- GS8.** use common sense and make judgments during day to day basis
- GS9.** use reasoning skills to identify and resolve basic problems using 5S
- GS10.** persuade team members to follow 5 S
- GS11.** ensure that the team members understand the importance of using 5 S tool
- GS12.** use innovative skills to perform and manage 5 S activities at the work desk and the shop floor
- GS13.** exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work emerge, techniques in CA/CI around 5 S work practices
- GS14.** do what is right, not what is a popular practice
- GS15.** follow shop floor rules& regulations and avoid deviations
- GS16.** lead by example in the plant premises while performing activities related to 5S
- GS17.** ensure self-cleanliness on a daily basis
- GS18.** demonstrate the will to keep the work area in a clean and orderly manner
- GS19.** accept additional responsibility for self and the team
- GS20.** encourage self and other to take greater responsibilities for managing 5S

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- GS21.** identify obstacles and bottlenecks in the process and find basic level solutions for removing these obstacles
- GS22.** use previous experience in resolving problems and taking decisions
- GS23.** make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure proper sorting of items at the work place</i>	10	25	-	-
PC1.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
PC2. ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use	1	2.5	-	-
PC3. ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions	1	2.5	-	-
PC4. ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	1	2.5	-	-
PC5.. segregate the items which are labelled at red tag items for the process area and keep them in the correct places	1	2.5	-	-
PC6.. ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions	1	2.5	-	-
PC7. check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	1	2.5	-	-
PC8. . oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material	1	2.5	-	-
PC9. ensure that areas of material storage areas are not overflowing	1	2.5	-	-
PC10. ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required	1	2.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure proper documentation and storage streamlining & organizing the workplace</i>	3	7.5	-	-
PC11. ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc	1	2.5	-	-
PC12. make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions	1	2.5	-	-
PC13. ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .	1	2.5	-	-
<i>Ensure cleaning of self and the work place</i>	4	10	-	-
PC14. ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards	1	2.5	-	-
PC15.. ensure workbenches and work surfaces are clean and in good condition	1	2.5	-	-
PC16.. ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination	1	2.5	-	-
PC17.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
<i>Ensure standardization</i>	5	12.5	-	-
PC18. ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant	1	2.5	-	-
PC19.. ensure all recyclable materials are put in designated containers	1	2.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. . ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes	1	2.5	-	-
PC21. ensure timely creation and sharing of the 5s checklists	1	2.5	-	-
PC22. ensure that the 5s manual are available as per the timelines	1	2.5	-	-
<i>Ensure sustenance</i>	7	16	-	-
PC23. ensure team cooperation during the audit of 5 s activities	1	2.5	-	-
PC24. ensure that workmen are periodically trained to address challenges related to 5s	1	2.5	-	-
PC25.. participate actively in employee work groups on 5s and encourage team members for active participation	1	2	-	-
PC26.. oversee that the staff/operators are trained and fully understand 5s procedures	1	2	-	-
PC27. . ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable	1	2.5	-	-
PC28. ensure continuous training of the team members on 5s in order to increase their awareness and support implementation	1	2	-	-
PC29. ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement	1	2.5	-	-
NOS Total	29	71	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0022
NOS Name	Ensure implementation of 5S activities at the shop floor & the office area
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	15/03/2014
Next Review Date	15/03/2016
NSQC Clearance Date	

Qualification Pack

ASC/N6508: Perform testing and validation of prototype

Description

This OS unit is about the individual testing and validating the prototype for product/individual components

Scope

The unit/ task covers the following:

- testing and validation of prototype
- resource management for testing and validation

Elements and Performance Criteria

Testing and Validation

To be competent, the user/individual on the job must be able to:

- PC1..** monitor and gather data related to field failures , warranty issues etc. from marketing , manufacturing, quality department to formulate & co relate test cycles with real life data
- PC2..** collate all the data and identify the patterns like the failures pertaining to frequent material failures for the individual components, abuse of the final product, type of frequent failures etc.
- PC3..** simultaneously identify the the requirements and specifications which need to be validated for prototype of product /various components from sor , discussions with R & D /NPD teams etc.
- PC4..** identify testing required for systems like styling, vibration, painting , electronics, design, chassis, electrical, powertrain & classify the same to be done on bench, vehicle etc.
- PC5..** safeguard the facilities for building physical prototypes and then execute tests and/or assigning resources to develop models and run simulations
- PC6..** translate design requirements into a set of test cases with loads and constraints that can be digitally and/or physically measured & /or have a basis in the international/national test standards
- PC7..** additionally, develop new test configurations (which may be mechanical, electrical, and/or software-based) given the latest engineering design (e.g., modifications to geometry, materials, substituted components) using techniques like design of experiments (DOE)
- PC8..** as required, design fixture and rigs/facilities to support testing
- PC9..** setup and execute the digital simulation model or the physical tests across all functional domains using standard operating procedures
- PC10..** use physical test data for defining material properties, boundary conditions and initial conditions for simulations for analysis software. .
- PC11..** use physical test data to create functional model of product
- PC12..** document the results of the physical or digital tests in reports, indicating the satisfaction of requirements and specifications
- PC13..** correlate the physical data with simulation results

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- PC14..** use physical test to validate or calibrate simulation results, such as pressure, flow, stress, strain, vibration and force from analysis software
- PC15..** perform stress analysis on the material of prototype using techniques like 2d , 3d modeling through finite element analysis (fea) simulation methodology in coordination with metallurgy department
- PC16..** document the correlation between simulation and physical tests
- PC17..** analyze the results obtained to identify passed/failed requirements
- PC18..** suggest and implement recommendations for failures that were encountered in concurrence with r&d team members.
- PC19..** in case of development of the new product , share the findings of the testing and validation of prototype with the NPD department

Resource management

To be competent, the user/individual on the job must be able to:

- PC20..** ensure the procurement of new test equipments/facilities/rigs etc. in coordination with sourcing department from the approved vendors
- PC21..** seek approval for recruitment of sufficient amount of staff in coordination with hr department for carrying out the various testing and validation activities
- PC22..** ensure that the new joinees are trained by the existing staff members in an efficient and timely manner
- PC23..** prepare the annual budget and seek approval from senior management
- PC24..** prepare MIS report for R&D testing and validation on monthly basis

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** product portfolio of organization
- KU2.** the manufacturing processes of organization
- KU3.** policies and procedures for preservation of test facilities
- KU4.** policies , compliances and systems followed for HSE
- KU5.** TS-16949/ISO14001/any other EMS system guidelines followed in the organization
- KU6.** New Product development protocol and methodology
- KU7.** manufacturing process being followed for each product
- KU8.** testing and validation procedures for R&D
- KU9.** stress analysis techniques application knowledge
- KU10.** simulation softwares used for validation
- KU11.** data analysis tools like 8Ds , five why analysis etc.
- KU12.** documentation requirements for testing and validation
- KU13.** documentation requirements for TS-16949/QMS system followed
- KU14.** standard room parameters and requirements
- KU15.** testing equipments operational knowledge
- KU16.** information systems like SAP, ERP etc.

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Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** understand the drawings for physical prototype and interpret the key characteristics like dimensions, profile, material etc
- GS2.** prepare the dimension testing reports for the prototype
- GS3.** understand the inspection reports of the Metallurgy departments
- GS4.** interpret the validation simulation results
- GS5.** prepare the testing and validation reports
- GS6.** the concerned departments for collating data pertaining to field failures , warranty issues
- GS7.** senior management for updating the progress and seeking support
- GS8.** team members for reviewing the progress of day to day activities
- GS9.** distribute workload for ensuring smooth progress of prototype validation and inspection activity within the desired timelines
- GS10.** coordinate with various departments like Metallurgy, Manufacturing, process Quality etc. based on the requirement
- GS11.** share operation knowledge with colleagues
- GS12.** think through and devise the countermeasure for resolution for any issue related to mismatch between physical test and simulation data
- GS13.** work on actions to be taken on immediate basis in case of frequent failures during the usage of product/individual component in field
- GS14.** resolve issues related to FEA analysis implementation
- GS15.** devise and implement interim/permanent countermeasures for the nonconformities observed during the product and the process audit based on the severity
- GS16.** brainstorm the reasons for abnormal special causes identified in SPC analysis for the unstable processes and devise their countermeasures
- GS17.** identify problems (technical and non-technical), disruptions and delays
- GS18.** analyze the interim countermeasures taken for the resolution of nonconformities observed in the product & process audit and accordingly devise the permanent countermeasures for prevention from re-occurrence

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Testing and Validation</i>	25	60	-	-
PC1.. monitor and gather data related to field failures , warranty issues etc. from marketing , manufacturing, quality department to formulate & co relate test cycles with real life data	2	3	-	-
PC2.. collate all the data and identify the patterns like the failures pertaining to frequent material failures for the individual components, abuse of the final product, type of frequent failures etc.	2	4	-	-
PC3.. simultaneously identify the the requirements and specifications which need to be validated for prototype of product /various components from sor , discussions with R & D /NPD teams etc.	2	4	-	-
PC4.. identify testing required for systems like styling, vibration, painting , electronics, design, chassis, electrical, powertrain & classify the same to be done on bench, vehicle etc.	2	4	-	-
PC5.. safeguard the facilities for building physical prototypes and then execute tests and/or assigning resources to develop models and run simulations	2	4	-	-
PC6.. translate design requirements into a set of test cases with loads and constraints that can be digitally and/or physically measured & /or have a basis in the international/national test standards	1	4	-	-
PC7.. additionally, develop new test configurations (which may be mechanical, electrical, and/or software-based) given the latest engineering design (e.g., modifications to geometry, materials, substituted components) using techniques like design of experiments (DOE)	1	4	-	-
PC8.. as required, design fixture and rigs/facilities to support testing	1	4	-	-
PC9.. setup and execute the digital simulation model or the physical tests across all functional domains using standard operating procedures	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10.. use physical test data for defining material properties, boundary conditions and initial conditions for simulations for analysis software. .	1	3	-	-
PC11.. use physical test data to create functional model of product	1	3	-	-
PC12.. document the results of the physical or digital tests in reports, indicating the satisfaction of requirements and specifications	1	2	-	-
PC13.. correlate the physical data with simulation results	1	3	-	-
PC14.. use physical test to validate or calibrate simulation results, such as pressure, flow, stress, strain, vibration and force from analysis software	1	3	-	-
PC15.. perform stress analysis on the material of prototype using techniques like 2d , 3d modeling through finite element analysis (fea) simulation methodology in coordination with metallurgy department	2	3	-	-
PC16.. document the correlation between simulation and physical tests	1	2	-	-
PC17.. analyze the results obtained to identify passed/failed requirements	1	3	-	-
PC18.. suggest and implement recommendations for failures that were encountered in concurrence with r&d team members.	1	2	-	-
PC19.. in case of development of the new product , share the findings of the testing and validation of prototype with the NPD department	1	2	-	-
<i>Resource management</i>	5	10	-	-
PC20.. ensure the procurement of new test equipments/facilities/rigs etc. in coordination with sourcing department from the approved vendors	1	2	-	-
PC21.. seek approval for recruitment of sufficient amount of staff in coordination with hr department for carrying out the various testing and validation activities	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22.. ensure that the new joinees are trained by the existing staff members in an efficient and timely manner	1	2	-	-
PC23.. prepare the annual budget and seek approval from senior management	1	2	-	-
PC24.. prepare MIS report for R&D testing and validation on monthly basis	1	2	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6508
NOS Name	Perform testing and validation of prototype
Sector	Automotive
Sub-Sector	R & D Support
Occupation	Testing and Validation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	27/09/2013
Next Review Date	30/09/2015
NSQC Clearance Date	

Qualification Pack

ASC/N6509: Monitor R&D lab testing activities

Description

This OS unit is about the individual monitoring the R&D test lab activities

Scope

This unit/ task covers the following:

- monitoring the R&D test lab equipments
- test facility planning and procurement
- internal QMS audit

Elements and Performance Criteria

R&D testing lab

To be competent, the user/individual on the job must be able to:

- PC1..** maintain a laboratory for testing and validation of prototypes for development of new products for various processes like vehicle , engine , chassis, suspension, brakes, fuel systems, computer testing, materials testing etc.
- PC2..** ensure that all the laboratories are well equipped with the testing equipments and the equipments are maintained on daily basis
- PC3..** monitor the ambient working conditions in the various testing laboratories and ensure compliance to the standard hse requirements
- PC4..** ensure that the standard operating procedures for all the inspection and testing activities are displayed inside the laboratories
- PC5..** train the associates working in the laboratories about the testing properties and procedures along with the hse compliances to be followed
- PC6..** ensure that the lab associates are adhering to usage of ppes while performing the testing activities
- PC7..** ensure that there is a schedule prepared for doing the activities and is being strictly adhered to
- PC8..** remotely monitor the calibration of the gauges and equipments used in testing laboratories by co-ordinating with the standards room
- PC9..** ensure that the records & documentation for testing are complete and updated on regular basis, &/or are part of knowledge management; with support from it teams etc. for special requirements viz. large files, tested samples etc.
- PC10..** ensure that the software programs coding, modification , updation etc. in the computer testing laboratory for equipments is being done as per requirement
- PC11..** ensure restricted access to the software programs by authorizing one person responsible for software coding and modification among team members of r&d testing
- PC12..** in case of receipt of new equipments , coordinate with the incharge and ensure safe , receipt , physical inspection of the packaged equipments
- PC13..** ensure preparation of reports and other support documentation pertaining to QMS/TS16949/ISO14001/EMS systems

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Test facility planning and procurement

To be competent, the user/individual on the job must be able to:

- PC14..** monitor the testing facilities working condition on periodic basis in coordination with the lab incharge
- PC15..** discuss with team about the received customer specifications viz. sor , international/ national testing specifications applicable to the products/ vehicles manufactured by the organization and analyze the testing methodology for the new/modified specifications
- PC16..** based on the review , finalize the requirements for the testing facilities/rigs and communicate to the team to arrange for the finalization of test facility manufacturers in coordination with sourcing department
- PC17..** remotely monitor the testing design and development activities by participating with the team and facility manufacturers to resolve any discrepancies
- PC18..** in case of a test facility requiring capex , as per sop seek approval from top management
- PC19..** monitor the validation results of prototypes from the new test facility and discuss with the team about the countermeasures for the deviations observed

Internal QMS Audit

To be competent, the user/individual on the job must be able to:

- PC20..** be a certified internal auditor for ISO/IEC 17025/any other QMS system by undergoing the training for internal audit
- PC21..** internally audit the r&d testing lab
- PC22..** discuss with testing process owners and take appropriate actions for meeting the requirements.
- PC23..** if required , be an auditee for the testing processes for the external audit by certification agency
- PC24..** ensure the smooth conduct of external audit and ensure the identified ncs are closed and signed off as per the timelines

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** complete knowledge about the product portfolio of the organization
- KU2.** in-depth knowledge of the manufacturing processes of the organization
- KU3.** certification agency for ISO/IEC17025 certification
- KU4.** testing facilities for validation of different prototypes
- KU5.** prototype manufacturing techniques
- KU6.** the knowledge requirements for internal auditor certification
- KU7.** guidelines for the QMS system followed for R&D laboratory testing
- KU8.** internal auditor training methodology
- KU9.** internal auditors checklist
- KU10.** QMS/ISO-IEC17025 system guidelines and requirements
- KU11.** testing done for validation of prototypes

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Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** communicate with the incharge and Sourcing department for monitoring the testing facility design and development activities in-house
- GS2.** coordinate with team members and laboratory incharge for progress updates of testing laboratories activities execution
- GS3.** communicate through telcon/video conferences/meetings with the Sourcing , Marketing , external customer ,SCM department etc. based on requirement
- GS4.** distribute workload among team members for performing R&D laboratory testing and validation activities in an efficient and timely manner
- GS5.** coordinate with team and gather inputs pertaining to reliability analysis, testing facility/rigs development, new product validation etc.
- GS6.** share operation knowledge with colleagues
- GS7.** present in front of the top management the results of testing and validation activities for R&D laboratories for their review
- GS8.** seek support from senior management as per requirement by sharing presentations/excel sheets for data pertaining to R&D testing and validation
- GS9.** understand the documentation done by testing facility vendor complying to ISO/IEC17025 system guidelines
- GS10.** understand the testing and validation data mentioned and accordingly devise strategies for addressal of concerns
- GS11.** interpret the testing and validation reports performed in laboratories
- GS12.** problems (technical and non-technical), disruptions and delays
- GS13.** escalation procedures
- GS14.** to work with a fall back action plan in the event of any issue
- GS15.** decide with respect to HSE compliance violations by the team members/gauge vendors
- GS16.** based on the process owners feedback , review and analyze the countermeasures effectiveness for NC closure

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>R&D testing lab</i>	14	36	-	-
PC1.. maintain a laboratory for testing and validation of prototypes for development of new products for various processes like vehicle , engine , chassis, suspension, brakes, fuel systems, computer testing, materials testing etc.	1	3	-	-
PC2.. ensure that all the laboratories are well equipped with the testing equipments and the equipments are maintained on daily basis	1	3	-	-
PC3.. monitor the ambient working conditions in the various testing laboratories and ensure compliance to the standard hse requirements	1	3	-	-
PC4.. ensure that the standard operating procedures for all the inspection and testing activities are displayed inside the laboratories	1	2	-	-
PC5.. train the associates working in the laboratories about the testing properties and procedures along with the hse compliances to be followed	1	3	-	-
PC6.. ensure that the lab associates are adhering to usage of ppes while performing the testing activities	1	3	-	-
PC7.. ensure that there is a schedule prepared for doing the activities and is being strictly adhered to	1	2	-	-
PC8.. remotely monitor the calibration of the gauges and equipments used in testing laboratories by co-ordinating with the standards room	2	4	-	-
PC9.. ensure that the records & documentation for testing are complete and updated on regular basis, &/or are part of knowledge management; with support from it teams etc. for special requirements viz. large files, tested samples etc.	1	3	-	-
PC10.. ensure that the software programs coding, modification , updation etc. in the computer testing laboratory for equipments is being done as per requirement	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11.. ensure restricted access to the software programs by authorizing one person responsible for software coding and modification among team members of r&d testing	1	2	-	-
PC12.. in case of receipt of new equipments , coordinate with the incharge and ensure safe , receipt , physical inspection of the packaged equipments	1	2	-	-
PC13.. ensure preparation of reports and other support documentation pertaining to QMS/TS16949/ISO14001/EMS systems	1	3	-	-
<i>Test facility planning and procurement</i>	10	20	-	-
PC14.. monitor the testing facilities working condition on periodic basis in coordination with the lab incharge	1	3	-	-
PC15.. discuss with team about the received customer specifications viz. sor , international/ national testing specifications applicable to the products/ vehicles manufactured by the organization and analyze the testing methodology for the new/modified specifications	2	4	-	-
PC16.. based on the review , finalize the requirements for the testing facilities/rigs and communicate to the team to arrange for the finalization of test facility manufacturers in coordination with sourcing department	2	4	-	-
PC17.. remotely monitor the testing design and development activities by participating with the team and facility manufacturers to resolve any discrepancies	2	3	-	-
PC18.. in case of a test facility requiring capex , as per sop seek approval from top management	1	3	-	-
PC19.. monitor the validation results of prototypes from the new test facility and discuss with the team about the countermeasures for the deviations observed	2	3	-	-
<i>Internal QMS Audit</i>	6	14	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20.. be a certified internal auditor for ISO/IEC 17025/any other QMS system by undergoing the training for internal audit	1	3	-	-
PC21.. internally audit the r&d testing lab	2	3	-	-
PC22.. discuss with testing process owners and take appropriate actions for meeting the requirements.	1	3	-	-
PC23.. if required , be an auditee for the testing processes for the external audit by certification agency	1	3	-	-
PC24.. ensure the smooth conduct of external audit and ensure the identified ncs are closed and signed off as per the timelines	1	2	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6509
NOS Name	Monitor R&D lab testing activities
Sector	Automotive
Sub-Sector	R & D Support
Occupation	Testing and Validation
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	23/09/2013
Next Review Date	30/09/2015
NSQC Clearance Date	

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Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Recommended Pass % aggregate for QP : 75

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N0006.Maintain a safe and healthy working environment	25	75	-	-	100	15
ASC/N0022.Ensure implementation of 5S activities at the shop floor & the office area	29	71	-	-	100	15
ASC/N6508.Perform testing and validation of prototype	30	70	-	-	100	35

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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N6509.Monitor R&D lab testing activities	30	70	-	-	100	35
Total	114	286	-	-	400	100

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

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Glossary

Sector	Sector is a conglomeration of different business operations having similar business 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.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

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Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment 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.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.