



RESEARCH DESIGNS & STANDARDS ORGANIZATION

Manaknagar, Lucknow – 226011

QO-D-8.1-15

Product development

1.0 Amendment History:

S. No.	Amendment Date	Version	Reasons for Amendment
1.	12.09.2018	1.0	First issue under ISO 9001:2015. Approved by DG/RDSO on NP-1 to NP-2 of MR/ISO9001/App/QMS/Doc/2018 on date 07.09.2018.No change in content from previous document no.QO-D-7.1-15 Ver 3.0 of 9001:2008 QMS.
2.	19.06.2020	1.1	Special DG VD (Vendor Development) has joined RDSO and looking after vendor development work. All proposal for ISO procedure related to vendor development , where it was earlier required to get the approval of DG/RDSO, now to be put up to Spl.DG/VD who is now designated as final authority in vendor development matters. DG's note no. DG/Misc. dated 15.Jun.2020 and 16 June 2020 to ED /VDG RDSO/LKO
3.	28.07.2022	1.2	Replaced word 'Directorate Head, or Head of Directorate' with 'ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)' and Responsible authority for 'Requirement of deviation from directive' under the sub head 'Responsibility and Authority' in existing ISO documents with "PED of the concerned Vertical". These changes are based on recommendation of Standing Committee and duly approved by Spl. DG/VD on date 19.07.2022 at Note#14 in e-office file no. RDSO-MR0ISO(VD-C)/1/2020-O/o ED/Res/RDSO-Part(2) (Comp. No 123324). Recommendations of Standing Committee is placed at Note#11 in the above e-office file.
4.	03.10.2022	1.3	Reference documents listed against para 5 of QO-D-8.1-15 has been rearranged in correct order as proposed by Standing Committee duly approved by Spl. DG/VD on 30.09.2022 at Note# 13 in e-office file No. RDSO-MR0ISO (VD-M)/1/2020-O/o MR/ISO/RDSO-Part (3) (Comp. No. 82786). Recommendations of Standing Committee placed at Note#9 of this file.

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ISO9001:2015	Document No: QO-D-8.1-15	Version No:1.3	Date Effective: 03.10.2022
Document Title: Product development			

2.0 Purpose

To define the process of development of new product / design for introduction on the Indian Railways.

3.0 Scope of Application

Applicable to all directorates of RDSO involved in the process of development of products / specifications for introduction of new technology / product for use on the Indian Railways.

4.0 Procedure / Details

There are five conceivable cases for introduction of new equipment / item for use on the Indian Railways. These are as listed below:

1. Technology and product is available in the open market.
2. Product is not readily available but manufacturers for similar items exist.
3. Technology is not available locally in the market, RDSO develops technology.
4. Technology is available in foreign railways/countries open market; RDSO does a Transfer of Technology with OEM
5. Technology is in operation on foreign railways & adopted on cross approval basis.

The following processes shall be adopted for product development for introduction of new equipment / item on the Indian Railways.

Prior administrative approval of competent authority shall be taken for start of the processes as outlined below.

Wherever required the directorate / project manager may propose hiring of consultant as per delegations provided under the schedule of powers.

Product development process shall follow the design development process as described in (**ref-1**). The following paragraphs contain specific instructions on how to process the different categories of product development.

4.1 Case 1: Technology and product available in the open market

The following process shall be followed.

4.1.1 Frame functional requirements

Functional requirement specification shall be framed by the directorate describing the purpose of use and desired characteristics. This document shall be placed on the RDSO website after approval of the ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)

4.1.2 Publication of EOI

An EOI shall be published for development of technical specifications for the functional requirements prepared earlier. The EOI shall be published as per the guidelines given in (**ref-2**)

4.1.3 Selection of panel

Out of the respondents to the EOI a panel of minimum three (if available) shall be selected for deliberations for development of specifications. The selection criteria for selection of panels shall be as provided in (**ref-2**).

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4.1.4 Finalize draft specification with STR in consultation with the select panel

The RDSO team in consultation with the selected panel shall finalize the specifications and the STR.

4.1.5 Creation and issue of specification

The RDSO process for creation and issue of specifications shall be followed for issue of new specifications. (*ref-3*)

4.1.6 Vendor approval process if required

RDSO vendor approval process shall be followed as required for development of vendors for the specification so finalized. (*ref-4*)

4.2 Case 2: Product is not available but manufacturers for similar items exist

The following process shall be followed in this case.

4.2.1 Frame functional requirements

Functional requirement specification shall be framed by the directorate describing the purpose of use and desired characteristics. This document shall be placed on the RDSO website after approval of the ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)

4.2.2 Publication of EOI

An EOI shall be published for development of technical specifications for the functional requirements prepared earlier. The EOI shall be published as per the guidelines given in (*ref-2*)

4.2.3 Selection of panel

Out of the respondents to the EOI a panel of minimum three (if available) shall be selected for deliberations for development of specifications. The selection criteria for selection of panels shall be as provided in (*ref-2*).

4.2.4 Willingness for joint development, if required

A willingness certificate shall be obtained from respondents for joint development.

4.2.5 Finalize draft specification with STR in consultation with the select panel

The RDSO team in consultation with the selected panel shall finalize the specifications and the STR.

4.2.6 Sanction of work

Based on the cost estimates for the development process, a detailed estimate shall be drafted and sanctioned for taking up the work of development as per the established process of creation vetting and sanction of estimates.

4.2.7 Orders for manufacture of prototypes

Tenders (open/special limited tenders) shall be called for development of the prototypes. This tender shall be evaluated and orders for manufacture of prototypes shall be issued to the each of selected parties.

4.2.8 Verification / validation of prototypes

The prototypes received shall be evaluated as per the draft specification. This shall be done as in two stages namely: verification of design calculations and validation of actual performance.

4.2.9 Iterate if necessary

Incase improvements are required in the prototype design; further orders may be given to develop further prototypes or to improve the same. This process should be iterated as required for finalization of the design and verification / validation of the prototype.

4.2.10 Finalize draft specification

The final draft specification shall be created by the RDSO team in consultation with the selected panel incorporating changes that are required over the period of the development exercise.

4.2.11 Creation and issue of specification

The RDSO process for creation and issue of specifications shall be followed for issue of new specifications. (*ref-3*)

4.2.12 Vendor approval process if required

RDSO vendor approval process shall be followed as required for development of vendors for the specification so finalized. (*ref-4*)

The firms who have successfully developed the product through this process of product development shall be listed on the RDSO's 'List of Approved Vendors' or 'List of RDSO Vendors for Developmental Orders' as applicable. They shall be exempted from payment of vendor registration fees.

4.3 Case 3: RDSO develops technology

When the technology / design are developed by RDSO the following steps shall be followed.

4.3.1 Follow internal design development process

The RDSO internal design development shall be followed for development of product design. In case prototype needs to be developed and tested along with updation of specifications the following steps shall be followed.

However, if prototype development and testing is not required then the steps may be omitted and process should be started at the stage of creation and issue of draft specification. The directorate shall record the reasons for adopting the shorter process and approval of Spl. DG/VD shall be obtained. For such specifications. The limitations and areas of further work to be done shall be mentioned as a part of the specification.

4.3.2 Publication of EOI

An EOI shall be published for finalization of specifications and development of prototypes if required and not developed. The EOI shall be published as per the guidelines given in (*ref-2*)

4.3.3 Selection of panel

Out of the respondents to the EOI a panel of minimum three (if available) shall be selected for deliberations for development of specifications. The selection criteria for selection of panels shall be as provided in (*ref-2*).

4.3.4 Willingness for joint development, if required

A willingness certificate shall be obtained from respondents for joint development.

4.3.5 Finalize draft specification with STR in consultation with the select panel

The RDSO team in consultation with the selected panel shall finalize the specifications and the STR.

4.3.6 Sanction of work

Based on the cost estimates for the development process, a detailed estimate shall be drafted and sanctioned for taking up the work of development as per the established process of creation vetting and sanction of estimates.

4.3.7 Orders for manufacture of prototypes

Tenders (open/special limited tenders) shall be called for development of the prototypes. This tender shall be evaluated and orders for manufacture of prototypes shall be issued to the each of selected parties.

4.3.8 Verification / validation of prototypes

The prototypes received shall be evaluated as per the draft specification. This shall be done as in two stages namely: verification of design calculations and validation of actual performance.

4.3.9 Iterate if necessary

Incase improvements are required in the prototype design; further orders may be given to develop further prototypes or to improve the same. This process should be iterated as required for finalization of the design and verification / validation of the prototype.

4.3.10 Finalize draft specification

The final draft specification shall be created by the RDSO team in consultation with the selected panel incorporating changes that are required over the period of the development exercise.

4.3.11 Creation and issue of specification

The RDSO process for creation and issue of specifications shall be followed for issue of new specifications. (*ref-3*)

4.3.12 Vendor approval process if required RDSO

vendor approval process shall be followed as required for development of vendors for the specification so finalized. (*ref-4*)

The firms who have successfully developed the product through this process of product development shall be listed on the RDSO's 'List of Approved Vendors' or 'List of RDSO Vendors for Developmental Orders' as applicable. They shall be exempted from payment of vendor registration fees.

4.4 Case 4: RDSO buys product with technology on ToT from OEM

4.4.1 Sanction of work

The process of sanction of work as a WP/RSP proposal shall be followed as required.

4.4.2 Finalize draft specification

Draft specifications shall be framed by the directorate describing the purpose of use and desired characteristics. This document shall be placed on the RDSO website after approval of the ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)

4.4.3 Publication of EOI

An EOI shall be published for finalization of specifications and development of prototypes if required and not developed. The EOI shall be published as per the guidelines given in (*ref-2*)

4.4.4 Selection of panel

Out of the respondents to the EOI a panel of minimum three (if available) shall be selected for deliberations for development of specifications. The selection criteria for selection of panels shall be as provided in (*ref-2*).

4.4.5 Finalize spec & STR in consultation with select panel

The RDSO team in consultation with the selected panel shall finalize the specifications and the STR.

4.4.6 Creation and issue of specification

The RDSO process for creation and issue of specifications shall be followed for issue of new specifications. (*ref-3*)

4.4.7 Tender for product and ToT

Tender for ToT shall be published based on the final specifications. The processing of the supply and ToT shall be done in accordance with the conditions of the finally accepted contract document.

It shall be ensured that the ToT provider provides the detailed documents defining the type and extent of control of the outsourced sub-assembly / process that affects product conformity to requirements.

4.4.8 Follow case 2 for further development and indigenization

Further development / indigenization of product or its sub components shall be done in following the guidelines under Case 2.

4.4.9 Vendor approval process if required

RDSO vendor approval process shall be followed as required for development of vendors for the specification so finalized.

The firm supplying the TOT shall be listed on the RDSO's 'List of Approved Vendors' for the equipment supplied.

The sub-suppliers who have supplied sub-components that have been tested by RDSO during the acceptance test of the complete equipment shall also be treated as approved vendor for the sub-component supplied by them.

Other sources of sub-components indicated by the TOT provider shall be listed as approved vendors.

All the firms as described here shall be exempted from payment of vendor registration fees.

4.5 Case 5: Adoption of technology on cross approval basis

4.5.1 Finalise draft specification

The draft specification shall be framed by the concerned Directorate describing the broad functional requirements and the purpose of use and desired characteristics. This draft specification shall be loaded on the RDSO website after the approval of ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)

4.5.2 EOI for interested foreign manufactures

An EOI shall be published for finalization of specifications and approval of prototypes if required and not developed. The EOI shall be published as per the guidelines given in (**ref-2**)

4.5.2.1 Submission of documents

The interested firms shall submit the following documents to RDSO:-

1. Independent verification and validation safety report based on standards as applicable and other related documents.
2. Environmental/climatic and EMI/EMC test reports of system and sub-systems.
3. Performance feedback of users of the equipments already installed over World Railways for minimum quantity as prescribed.
4. History of modifications in the hardware and software of the equipment and their reasons.
5. Commitment of the firm for maintenance and repair support in India.
6. Details of testing and repairing facilities proposed to be installed in India.
7. Detailed documents defining the type and extent of control of the outsourced sub-assembly / process that affects product conformity to requirements.

4.5.3 Selection of panel

Out of the respondents to the EOI a panel of minimum three (if available) shall be selected for deliberations for development of specifications. The selection criteria for selection of panels shall be as provided in (**ref-2**).

4.5.4 Finalize spec & STR in consultation with select panel

The RDSO team, in consultation with the selected panel and zonal railways, shall finalize the specifications and the STR.

4.5.5 Examination of documents

Examine the documents and various tests done on the product. This may include independent validation and testing wherever required.

4.5.6 Willingness to indigenize the product

The firm shall be requested to give its willingness to indigenize the product in a prescribed timeframe.

4.5.7 Provisional approval for performance assessment

If the documents and details submitted by the firm are found in order, the provisional approval to supply limited number of equipments for field trial for performance assessment shall be given to the firm.

4.5.8 Field trials

The cross approved equipment shall be monitored during the course of field trials.

4.5.9 Approval for regular supply

Based on the performance in the field of the equipments for a prescribed equipment months, the regular approval to the firm to supply equipments to Indian Railways shall be given.

4.5.10 Follow up for indigenization

After the creation of necessary infrastructure required for indigenization, the capacity-cum-capability of the local firm shall be assessed.

After indigenization, the annual progress of indigenization shall be monitored and after completion of indigenization, the firm has to offer indigenized prototype sample for type testing to RDSO in a given timeframe. The type testing shall be applicable as in case of any other indigenized product developed in India

4.5.11 Creation and issue of specification

The RDSO process for creation and issue of specifications shall be followed for issue of new specifications. (*ref-3*)

4.5.12 Vendor approval process if required

RDSO vendor approval process shall be followed as required for development of vendors for the specification so finalized.

The approved firm shall be listed on the RDSO 'List of Approved Vendors' or 'List of RDSO Vendors for Developmental Orders' as applicable for the equipment supplied.

The sub-suppliers who have supplied sub-components that have been tested by RDSO during the acceptance test of the complete equipment shall also be treated as 'Approved Vendors' or included in the 'List of RDSO Vendors for Developmental Orders' as applicable for the sub-component supplied by them.

Other sources of sub-components indicated by the ToT provider shall be listed as approved vendors.

All the firms as described here shall be exempted from payment of vendor registration fees.

5.0 Referenced Documents

Ref.SNo.	Document Number	Document Name
1.	QO-G-8.3-1	Design and development
2.	QO-D-8.1-16	Publishing expression of interest
3.	QO-D-8.1-1	Creation of equipment, item specification
4.	QO-D-8.1-5 to 14	Vendor Development process guidelines

6.0 Referenced Documents of External Origin

None

7.0 Associated Records

As required by the RDSO design development process, and office files as required.

8.0 Responsibility and Authority

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of this document	MR/ISO Cell	Spl. DG/VD	Staff of ISO Cell	Standing Committee	All directorates through intranet
Compliance of directives contained in this document.	Director In-charge of Directorate	ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level)	Directorate Staff		
Requirement of deviation from directive.	PED of the concerned Vertical	Spl. DG/VD	Respective officer of directorate	MR/ISO Cell	All directorates through intranet

9.0 Abbreviations

None