Guideline for Power System Design Approval

URA 1002:2021

Guideline for Power System Design Approval

This guideline for Power System Design Approval is made under law no. 26/2020 “Utility Regulatory Authority’s Act”.

All Power Systems Designs for the provision of electricity services need to be approved in accordance with this guideline, prior to commencement of any procurement & installation works of any part of the power system.

This will act as a guiding document for URA Licensed Engineers (Electrical) and Utility Companies for the submission of Power System Design documentation for approval by the Utility Regulatory Authority. This document will also detail out the approval process which needs to be followed by all licensed engineers.

The approval process will be as per the following stages.

Stage 1 (Application Submission & Pre-Check)

Along with every Power System Design documentation, the following mandatory documents have to be submitted.

1. Completed, Stamped & Signed Power System Design Approval Application Form (ENE05) available at URA website.
2. Letter from the island council (for inhabited islands), business owner (for resorts, industrial islands, industrial facilities, etc.)

   This letter should indicate the Atoll, Island Name (geographic & business), installation location (for industrial facilities) & details of engineer (including license number) assigned.
3. Construction Permit issued by Ministry of Tourism (For Resorts)
4. Land Permit issued by the relevant council (For Inhabited Islands)
5. Declaration of the Engineer (Annex – 1)
6. Power System Design document prepared as per the guideline (Annex – 2)

   This document cannot be submitted in parts. However, exceptions can be made for decision letters, certificates etc. that are required to be submitted.

The Power System Design document will first be pre-checked to verify if all parts/sections of the guideline are included in the document and will be rejected if found otherwise.

Stage 2 (Technical Evaluation)

If all documents from Stage 1 of this Approval Process is found to be valid and complete, the document will be handed over to an Engineer from the URA for technical evaluation.

The evaluation duration may vary depending on the size of the documentation, and this will be notified to the engineer upon acceptance of the application.

If the any issues with the design are noted by URA, an engineer from URA will contact the applicant to collect and resubmit the document after correcting any highlighted mistakes.

If the Power System Design is found to technically acceptable, an official endorsement will be stamped on the relevant pages of the document.

Note:

- This approval is only given for the technical aspects of the power system & is not a permit to operate the power system.
- Any changes to the Approved Design will require a re-submission for the approval of that change**.**

Once Stage 2 is completed, URA will issue a *Design Approval*. Applicant should ensure that any procurement or construction works do not commence before design is approved.

Stage 3 (Inspection)

After the installation works of the power system is completed, the Power System will need to be inspected by URA, to confirm compliance with Approved Design.

If the 'as-built' is found to be different from the Approved Design, the consultant will be given a reasonable amount of time to rectify or justify the issue(s) depending on its nature. If the changes proposed are reasonable, it may be accepted by URA after evaluation.

If this includes a change to the approved design or any changes to the installation. For changes in design, the Power System Approval need to be resubmitted with corrections. For changes in system installation, the consultant may send evidence photo/video to URA regarding the rectification, that is acceptable for URA.

URA reserves the right to impose penalties or in severe cases, revoke any Design Approval, should the applicant fail to comply with URA requirements under this guideline.

Annex 1 – **Declaration**

[Sender Address]

[Date]

The Chief Executive,
Utility Regulatory Authority,
Handhuvaree Hingun,
Male’, 20392,
Republic of Maldives,

Dear Sir,

DECLARATION

I **[Name]** with Licensed Number **[License-Number]** declare that all information provided with this document **(Title of Document)** is true and shall produce proof of such information if I am called upon to do so. I am aware that the Utility Regulatory Authority (URA) reserves the right to reject this application, if URA finds that the information provided is inaccurate or incomplete. Furthermore, if such information is found to be misleading and/or falsified, the URA reserves the right to impose penalties or take legal action, in accordance with the relevant laws, regulations, guidelines and procedures. Such penalties may range from suspension of permits/license, fines, and in severe cases criminal prosecution.

Sincerely,

[Signature]
[Name]
[License-Number]
[Contact-Number]

Annex 2 - **Guideline for Power System Approval**

1. Powerhouse

- a. Powerhouse layout – Showing immediate surrounding that should include the following.
    - i. Proper labelling on scaled map.
    - ii. Map to span up to the nearest habited buildings
    - iii. Show distances from neighboring buildings
    - iv. All key structures of power house
- b. Powerhouse floor plan
    - i. Major Dimensions
        - 1. Distance between Generator sets
        - 2. Distance from Generator sets to nearest wall in all directions
- c. Powerhouse Sectional View
    - i. Elevation
    - ii. End view
    - iii. Major dimensions
        - 1. Height of Generator
        - 2. Height of Powerhouse
        - 3. Height of Chimney/Exhaust
        - 4. Height of Other major equipment
        - 5. Height of doors and relevant infrastructure
- d. Fuel System layout
    - i. Single Line Drawing of Fuel System (including main tank and day tank piping)
    - ii. Fuel System layout on a scale diagram
    - iii. Drawings of Fuel Storage showing necessary protection measures such as bund wall
- e. Table of fuel storage with the following
    - i. Tank Number
    - ii. Tank Type (Day/Bulk)
    - iii. Tank Material
    - iv. Tank Size
- f. Fuel Specifications & Fuel Test Report

2. Generating & Transmission Equipment

- a. Table of numbered Diesel-powered Generating equipment along with their 100% and 80% rating in kW, kVA, A
- b. Datasheets of Diesel-powered Generating equipment. If Datasheet includes multiple models, the model number should be highlighted
- c. Renewable Energy
    - i. Nominal Rating of Generating Source(s)
    - ii. Inverter Sizing & Technical Datasheet
    - iii. Battery Sizes & Technical Datasheet
    - iv. BMS & EMS Technical Datasheet
- d. Table of numbered Transmission equipment along with their rating 100% and 80% rating in kW, kVA, A

- e. Datasheet of Transmission equipment. If Datasheet includes multiple models, the model number should be highlighted
- f. Table of numbered Protection Devices used in Voltages 1000V or above
- g. Datasheet of Protection Devices.

3. Generator Control Panel & Distribution Panels

- a. Single Line Drawing of Main Switchboard (MSB) showing the following
  - i. Generators and downstream protection devices and controllers
  - ii. Busbar configuration, dimensions, materials and rating.
  - iii. Labelled Feeders and downstream protection devices
  - iv. CT/VT Ratios where applicable

4. Distribution Network

- a. Layout of LV Distribution Network, Distribution Boxes and Service Cables on a scaled map
- b. Layout of MV Distribution Network, Substations and Service Cables on a scaled map
- c. Single Line Drawing of the LV Distribution Network with feeder pillars and distribution boxes, showing cable length, size, voltage drop, and percentage voltage drop.
- d. Single Line Drawing of the MV Distribution Network with feeder pillars and substations, showing cable length, size, voltage drop, and percentage voltage drop.
- e. Voltage drop calculations in a tabulated matter with the following
  - i. Must show FROM & TO (ie. Feeder Number/ Distribution Box etc)
  - ii. Cable Size
  - iii. Cable Length
  - iv. Voltage Drop (V)
  - v. Voltage Drop (%)
- f. Single Line Drawing of panels showing the following (For power distribution panels with MCCB ≥ 63A)
  - i. Outgoing feeder ratings and protection devices
  - ii. Busbar configuration and rating
  - iii. CT/VT Ratios where applicable
  - iv. Proper referencing to incoming feeder in MSB
  - v. List of outgoing distribution boxes and sub-distribution boxes with their references

5. Cable

- a. Table of Cables consisting of the following information
  - i. Fields Required
    1. From – To
    2. Model
    3. Size
    4. Length
    5. Conductor Material
  - ii. Should cover the following aspects of the power system
    1. Generator to MSB
    2. MSB/Feeders to Outgoing Panels/Distribution Boxes

        3. Subsequent Panels/Distribution Boxes
        4. Cables used in Buildings (Exempt from 5.a.i.1 & 5.a.i.4)
   b. Conformity Certificate of Cables if not already approved by URA

6. Load

- a. Load calculation of the system
    - i. Consolidated load calculation
        1. Panel/DB/Substation Reference
        2. Load in kW, KVA, A
        3. Diversity Factor, Load Factor
        4. Brief description of Load (ex. # of rooms)
- b. Detailed load calculation
    - i. Load Calculation for similar loads such as rooms can have a single load calculation
- c. Load Forecast of the system 5 years

7. Fire Fighting System and Lightning Protection

- a. Certification or documentation of approval of firefighting system from the relevant government approved agency
- b. Lightning Protection coverage
    - i. Powerhouse
    - ii. Fuel Storage Tanks
    - iii. Major Equipment within the powerhouse vicinity
    - iv. Substations
- c. Lightning protection device(s) and their specification

8. Environmental Impact Assessment

- a. Certification or documentation of approval from the relevant government agency

Note:

- Documents submitted under 1, 2, 3, 4, 5, 6, 7.b and 7.c of the *Guideline for Power System Approval* should be checked and verified by a URA Licensed Power Engineer who is issued with the relevant categories.
- Parts not relevant should be marked as such
- All documents submitted (hard-copy) should be bound together; documents larger than A4 size should be folder to A4 size
- Soft copy in DWG/DXF format of Parts 1.a, 1.b, 1.c, 3.a, 4.a, 4.b, 4.c, 4.d, 4.f & 7.b should be submitted via a CD-R
- Soft copy in XLS format of Parts 4.e & 6.a should be submitted via a CD-R
- Information on all documents should be legible
- Minimum 2 sets of the original documents (hard copies) should be submitted
- Proper referencing needs to be given where necessary
- Additional information relevant to the Power System Design, apart from what is required in this document needs to be provided upon request by URA.