

Road To Power HV Flexible Connection Tool RAG Logic Specifications

Document scope

This specification details the RAG logic for the Road To Power HV Flexible Connection Tool Specification.

The thresholds are based on previous tool assessment logic and are subject to update to suit HV Connections.

CONFIDENTIAL - This document may not be disclosed to any person other than the addressee or any duly authorised person within the addressee's company or organisation and may only be disclosed so far as is strictly necessary for the proper purposes of the addressee which may be limited by contract. Any person to whom the document or any part of it is disclosed must comply with this notice. A failure to comply with it may result in loss or damage to EA Technology Ltd or to others with whom it may have contracted and the addressee will be held fully liable therefor.

Care has been taken in the preparation of this Report, but all advice, analysis, calculations, information, forecasts and recommendations are supplied for the assistance of the relevant client and are not to be relied on as authoritative or as in substitution for the exercise of judgement by that client or any other reader. EA Technology Ltd. nor any of its personnel engaged in the preparation of this Report shall have any liability whatsoever for any direct or consequential loss arising from use of this Report or its contents and give no warranty or representation (express or implied) as to the quality or fitness for the purpose of any process, material, product or system referred to in the report.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means electronic, mechanical, photocopied, recorded or otherwise, or stored in any retrieval system of any nature without the written permission of the copyright holder.

© EA Technology Ltd

May 2025

EA Technology Limited, Capenhurst Technology Park, Capenhurst, Chester, CH1 6ES;

Tel: 0151 339 4181 Fax: 0151 347 2404

<http://www.eatechnology.com>

Registered in England number 2566313

Version History

Date	Version	Author(s)	Notes
28/02/2025	0.1	L. Guthrie	Initial Document from Internal RAG Assessment Specifications then reviewed for delivery based on recent tool updates
01/05/2025	0.2	L. Guthrie	Adjustment to match final logic in demonstration tool

Final Approval

Approval Type	Date	Version	EA Technology Issue Authority
Review	20/05/2025	1.0	Ben Taylor

1. Baseline Assessment

A Debut assessment, which is a type of power systems analysis, is required to obtain all required results. The results will be compared to a set of thresholds and combined to create the overall RAG colour for a component.

For the Road to Power HV Flexible Connections assessment, these thresholds must be assessed for every half-hourly (HH) period.

The components that must be assessed are:

- The transformer utilisation
- The cable utilisation

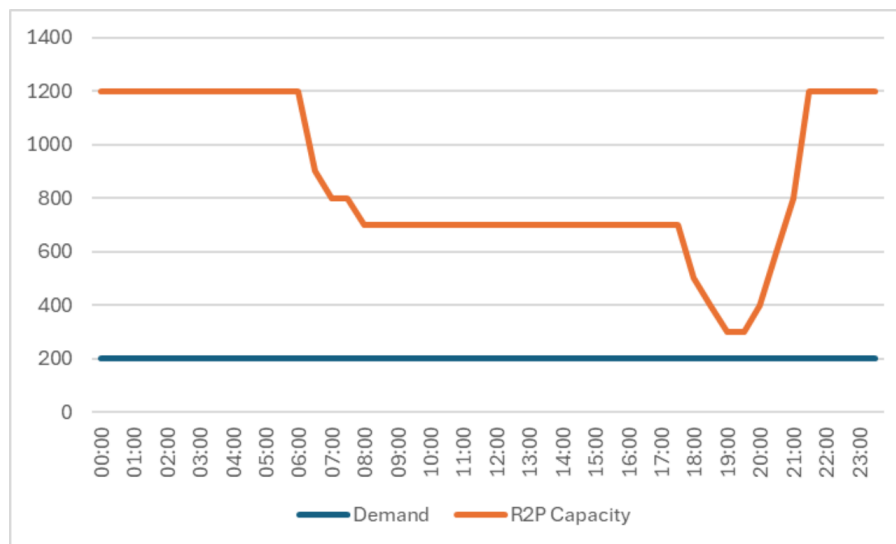
The **results** will be cascading: a Red conductor will have conductors downstream of it also being Red. If a conductor is Amber, all conductors downstream of it will also be at least Amber. Transformers will also cascade their colour meaning any cable downstream a Red transformer will also be Red. Green cables can only be possible if the Transformer is Green, and for Amber transformers cables will at least be Amber.

The overall RAG for a network component will be the highest-order colour for the set of results: Grey > Red > Amber > Green.

When network capacity or assessed network capacity is used within this document it refers to the previous hierarchy of the **results**.

The following graphs are used to visualise the explanations for each RAG status. Is it important to consider the assessment of the networks assets for each of the 48 half hourly periods.

Green:

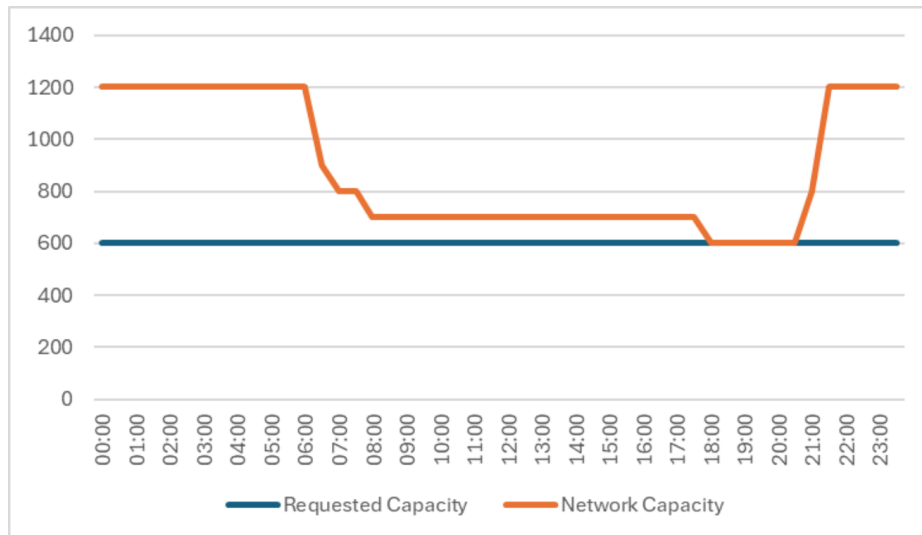


Green = Demand is below 80% available capacity for every 48 half hourly period

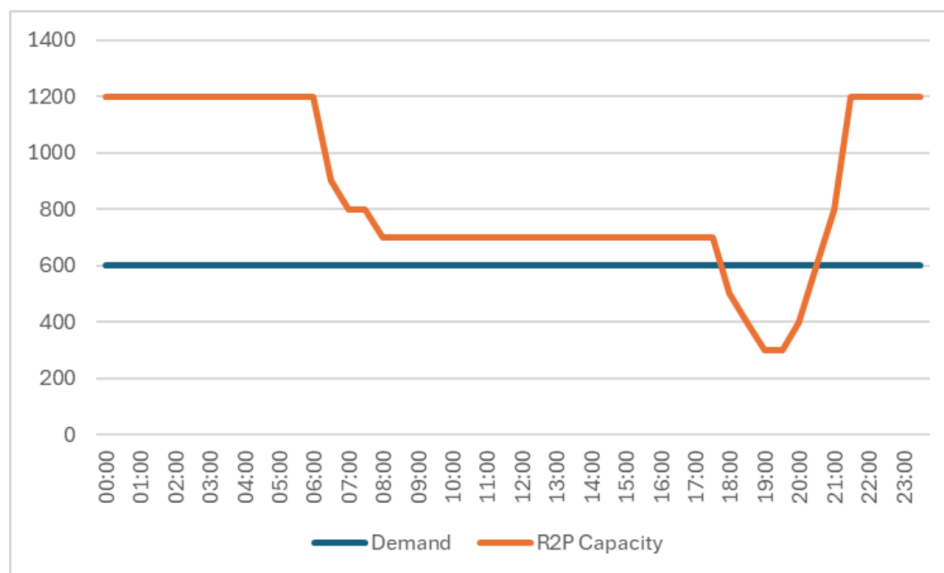
A green assessment means that the connection's requested maximum capacity is available in every one of the 48 half hour periods.

Amber:

Within this specification there are two sets of conditions that will be assessed as Amber. These are two distinct option assessments and at present they will both be shown as amber.

Amber Assessment A:

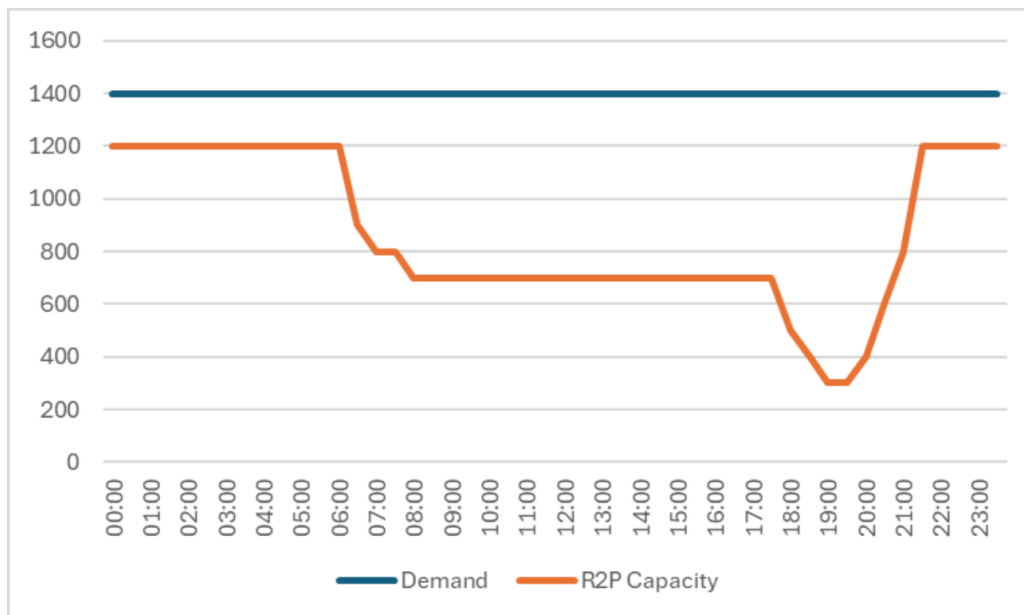
Amber = Demand is equal to or between 80% and 100% available capacity for any of the 48 half hourly periods

Amber Assessment B:

Amber = Demand exceeds the 100% available capacity for the assessed network for up to 24 out of the 48 half hourly periods

Within this proof-of-concept tool, there are likely to be edge cases that are not completely accounted for or add too much complexity to the debugging process. In these cases, the proof-of-concept tool will default to a Red assessment.

Red:

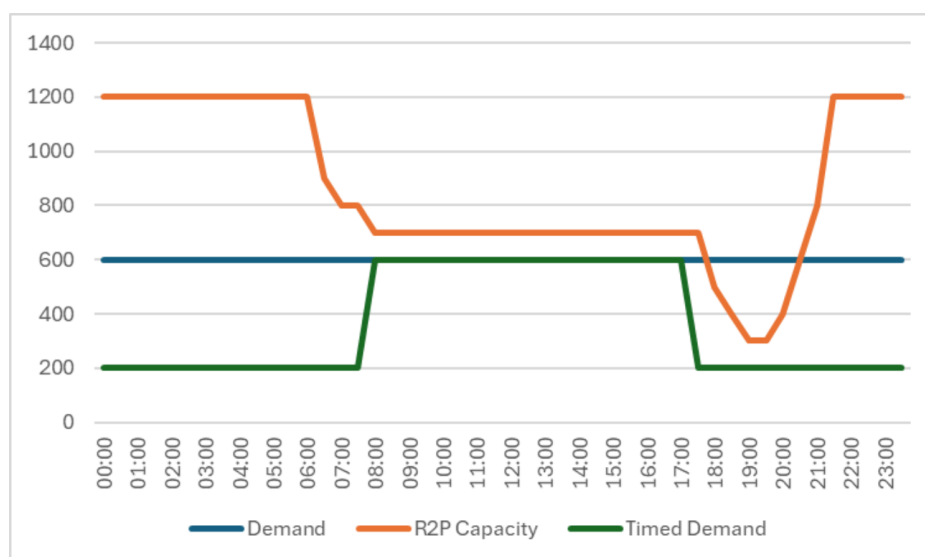


Red = Requested connection capacity is greater than the available network capacity for over 24 of the 48 half hourly periods

Example of a connection profile varied over time:

These graphs are used to display an example when a user provides on the maximum capacity for their connection. After a user has chosen to connect to an Amber section of the network, they will be able to assess their load profile against the network and adjust their load profile where required.

The graph below demonstrates a 48 half-hourly demand profile where the peak occurs between 7:30 and 17:00, so the connection capacity does not exceed the available capacity. This would be an example of a proposed time profiled standard connection.



These values are for demonstration purposes only, not any real values from the tool.

1.1 Assessment Logic

The existing RAG logic for other EA Technology connections tools, which is used as the basis for the logic in this proof of concept, is shown below. Grey is used where there is no network information available within the assessment and is the highest ranked within the RAG assessment.

The values for source loop impedance are being checked and will be provided (alongside the correct terminology for HV networks) once available.

	Green	Amber	Red	Grey
Transformer Utilisation	$\leq 80\%$	$80\% < U \leq 100\%$	$> 100\%$	No result
Cable Utilisation	$\leq 80\%$	$80\% < U \leq 100\%$	$> 100\%$	No result
Volt Drop	$\leq 3.834\%$	$3.834\% < V \leq 4.794\%$	$> 4.795\%$	No result