

Distribution Code Review Panel
Protection Engineer assessment Working
Group

Draft Document for

Procedure for Assessment of Protection
Relay
Testing Engineers

INTRODUCTION

Electrical Protection system testing is very critical for the reliability of the power system. If the protection system testing and relay settings are not done correctly the malfunction of the protection system can result in equipment damage, fire, injury/fatality of personnel and financial losses.

It is essential that the testing of the protection system, including relay settings in accordance with the approved setting schedules, is carried out by a qualified and competent person. To ensure that the person doing the protection testing and setting is qualified and competent, he shall be assessed and approved as per this procedure by Protection Engineer Assessment Working Group of the DCRP. The assessment is carried out by the panel listed in this document.

APPLICABLE STANDARDS, SPECIFICATIONS AND CODES

- OES Standards
- Distribution Code
- Grid Code

TESTING ENGINEER ASSESSMENT

QUALIFICATION

The candidate shall be having minimum a degree from a recognised university in electrical engineering. Any additional qualification or courses in Electrical protection system is preferable.

He shall be capable of carrying out electrical protection calculations, short circuit studies, CT calculations etc. This shall be verified during interview and practical test.

EXPERIENCE

Minimum 8 years experience in a reputed firm(s) in electrical engineering works. Out of the 8 years he shall possess at least 5 years experience in testing and commissioning of protection system. Experience in testing and commissioning of high voltage transmission system, and high voltage substations etc. is a must. He should have a good knowledge of latest electrical protection relays and testing equipments.

DCRP ELECTRICAL AUTHORITY

The protection engineer shall possess DCRP Protection authority certificate. He shall be familiar with Electrical Safety Rules & and electrical permit systems.

ASSESSMENT

ASSESSMENT PANEL

The assessment shall be carried out by the Protection Engineer Assessment Working Group panel approved by the DCRP.

Following is the present panel:

Custodian	:	DCRP	
Panel Chairman	:	Head of Planning & Studies	(MZEC)
Panel Member	:	Head of Protection	(MDEC)
Panel Member	:	Head of Protection	(MJEC)
Panel Member	:	Head of Protection	(OETC)

PROCEDURE

PROCESSING APPLICATION

The candidate shall forward his CV through his company responsible person with a covering letter from the company to the DCRP Secretary.

The CV shall include details of the candidate's qualification and experience. The relevant supporting documents, copies of certificates etc., shall be attached with the application.

Upon receipt of the application DCRP Secretary shall register the application and forward it to the Panel Chairman for assessment.

PERSONAL INTERVIEW

- The Chairmen of PEAWG to make appointment with the candidate for the interview.
- Carry out interview with minimum three members.
- To confirm that the details given in the CV are correct and the candidate possesses required qualification and experience
- If the candidate has failed in the interview test Chairman shall inform the candidate through the DCRP Secretary and advice the candidate not to apply for assessment again for at least 6 months.
- Candidates successful in interview test shall be called minimum next day in for a practical interview at OETC Protection test bench.

PRACTICAL TEST

- OETC Protection engineers and one member of the panel shall carry out a practical test. Ensure that the candidate is capable of testing,
- Closely monitor the test being carried out and ensure that the candidate is really competent and posses sufficient knowledge and experience in testing the relays.
- The candidate should be familiar with modern relays testing kits with their testing software's.

ISSUE OF CERTIFICATE

- If he passed in both, personal interview and practical test, initiate action to issue him the DCRP certificate.
- DCRP shall issue the Certificate license.
- Licence should be for three years period and applicable for renew by application letter form contractor.

CERTIFICATE FEES

- Certificate fees on new applications or renewals will be R.O
- The fees on issuing the certificate shall be born by the contractor/individual engineer and to be forward to DCRP Bank account.

APPENDIX-1 GUIDELINES FOR PERSONAL INTERVIEW

- The questions will vary depending upon qualification and experience of the candidate.
- The panel should frame the questions based on the uniform test sheet.
- Arrange a proper atmosphere for the interview
- Before the interview familiarise with the CV of the candidate
- Prepare points for putting up the questions to the candidate based on his experience / qualification.
- Question him about his qualification, nature of the courses, main subject covered etc. based on his CV. This will ensure that what is stated in the CV are correct.
- Explore his experience in the protection field. This should establish that he possess actual hands on experience in protection system testing and settings of relays. Ensure that he has carried out protection system testing and setting him, not merely watching. The questions and answers should establish the type of work he has carried out, the types of relays he has handled etc.
- Question him to explore his theoretical knowledge in power system and system protection

Explore about his knowledge in:

- Protection calculations
- Short circuit study
- Fault level

Find out his knowledge about protection coordination software, such as ETAP, Dig-Silent etc.

- If assessment shows that he got more than 70% of counted points, he will be passed to the practical test; otherwise he will be counted as failed.

APPENDIX-2 GUIDELINES FOR PRACTICAL INTERVIEW

1.0 Drawing and Schematic Knowledge

Reading & Understanding the Schematic Drawing including:-

- 01 AC Drawing.
- 02 DC Drawing.
- 03 Interlocking Scheme.
- 04 General Arrangement Drawing.

** Using paper & pin Draw logic on how can test & commissioning the following:


- 01 Power transformer Differential Stability test
- 02 Power transformer REF Stability test at HV & LV
- 03 Current Differential test (local & Remote).
- 04 Transformer (Delta star) vector group connection.
- 05 Transformer (Star Delta) vector group testing and connection
- 06 Busbar Stability

2.0 Testing skills

- Familiar on using Different secondary test kit (KDK, FRAJA300, Omicron, Megger.....)
- General Familiarisation on using Different Primary test kit.
- General Familiarisation HV Pressure test kits.

3.0 Practical testing

- Test knee point of C.T and Draw the relation between I_{mag} and Voltage and explaining the graph.
- Arrange wiring from testing kit to any selected relay.
- Using Secondary FRAJA300 Test kit to test O/C, E/F and Distance relays and show results.

<p>Distribution Code Review Panel DCRP Protection & Testing Engineer License [Distribution System Less than 132kV]</p> <p>License No: Name: Company: Date of issue: Date of Expiry:</p>	
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This Card is Property of DCRP and may be used only by the licensed person, if found please return to DCRP Contact address:

**The DCRP Established to Article (90) of Royal Decree 78/2004
Electricity Sector-Sultanate of Oman**