

Grid Readiness, Integration and Performance (GRIP) Requirements Consolidated Executive Summary

Topic	Purpose	Rationale	Performance Requirement	Application
Conductor & Line Optimization	Standardize conductor/tower configuration selection to meet technical needs at lowest life cycle cost.	Reduce capital, O&M, and thermal losses over asset life.	Select the viable option with the lowest net present value.	All applicable bulk transmission line projects.
Dynamic Reactive Power	Ensure generating facilities—especially IBRs—provide adequate dynamic reactive power.	Support voltage stability and recovery during faults or fast load swings.	Operate between 0.9 pf (supply) and 0.95 pf (absorb), unless otherwise specified.	All new or modified generating facilities.
Effective Grounding	Maintain effective grounding per ISO Rules.	Prevent TRV/TOV, equipment damage, and protection failures.	Healthy phase voltage at POC $\leq$ 0.8 pu during unbalanced grounded faults.	Projects identified by AESO as grounding risk.
Harmonics	Demonstrate compliance with harmonic limits.	Prevent equipment heating, losses, resonance, and control/protection interference.	Harmonic voltage/current at POC within ISO Rule 503.11 and AESO IBR limits.	Facilities with IBRs or power electronics.

Topic	Purpose	Rationale	Performance Requirement	Application
Sub Synchronous Oscillation	Identify and mitigate SSR and power electronic interaction risks.	Prevent damaging oscillations and misoperations.	Do not introduce or worsen SSO; EMT results show positive damping; mitigation applied if needed.	Projects with elevated SSO risk.
System Restoration Cranking Path	Ensure new connections do not impair system restoration plans.	Limit MVar charging, Ferranti effects, and restoration delays.	No degradation to restoration plan viability.	Evaluated by AESO during alternative selection; mitigations via FS if required.
System Strength	Assess stable operation in weak grid conditions.	Address oscillations, instability, and protection sensitivity as synchronous generation declines.	Positive damping; no sustained/growing oscillations; remain connected and recover as required.	Projects with elevated system strength risk.
Transformer Energization	Assess impacts of energizing transformers.	Prevent overvoltages, ferroresonance, harmonics, and protection issues.	POC RMS voltage dip < 4%; harmonics within IEEE 519.	High risk projects with large transformers.
Series Compensated Line Connection	Assess risks specific to series compensation.	Address SSO, overvoltages, harmonics, and protection challenges.	Conduct SSO per AESO guideline; TFOs set equipment criteria.	All connections to series compensated lines.
Protection Coordination	Maintain proper protection coordination.	Prevent unnecessary outages, equipment damage, or cascading trips.	Meet ISO Rule 503.15; comply with ID #2020 018 clearing times for generating units.	All applicable projects.
Anti Islanding	Prevent unintentional electrical islanding.	Address safety hazards, abnormal voltages, and protection misoperations.	Unintentional islands are not permitted; assessment and mitigation required.	All transmission connected generation.