**Technical Specifications for Development of Full Automated Project of Zhinvali HPP Process Operation**

List of Zhinvali HPP Core Process Equipment:

1. Hydroelectric installation (turbine РО-170-В-180, generator СВ 425/135-14), capacity 32,5 MW, 4 -sets;
2. Generator circuit-breaker МГУ-20, 4 kV;
3. Two sections of 10,5 kV bus bars, with two МГУ-20 type circuit-breakers;
4. Power transformer ТД- 80000/220/10,5, 2 kV;
5. Power transformer ТРДЦН- 63000/110/10,5;
6. Power transformer ТМТН- 6300/110/10,5 ;
7. Dividing transformer ТМ- 1000/10,5/10;
8. Auxiliary service transformer ТСЗС 1000/10, 2 kV;
9. Auxiliary service transformer ТСЗС 630/10, 3 kV;
10. 220 kV, GL 314 F3 type electric gas breaker, 2 kV;
11. 220 kV, S2DAT-245 type airblast circuit breaker with electric drive, 5 kV;
12. 110 kV, ММО-110 type oil circuit breaker, 2 kV;
13. РНД-110/1000 type airblast circuit breaker with manual drive, 5 kV.

Power plant one-line diagram is attached.

It is necessary to inspect the facility on-site and to develop the following tentative design documentation:

1. Reconstruction of generator cross-field excitation system on semiconductor rectifiers, with automatic control;
2. Modernization of temperature control of generating units;
3. Replacement of 110 kV circuit breakers by electric drive breakers, 5 kV;
4. Continuous control of vibration of generating units;
5. Continuous measurement of water flow in the turbines;
6. Control butterfly valves;
7. Control of hydro turbines by selecting optimal operation, process protections and alarm system;
8. Control of generating units individually as well as in parallel regime;
9. Electric and process protections of the generators. Measurement of electric parameters;
10. Power transformer (T-1, T-2, T-3 and T-4) protections and alarm system;
11. 220 kV breaker control (A-1 and A-2);
12. Protection of 220 kV transmission line and measurement of electric parameters;
13. Control of 110 kV breaker, protection and measurement of transmission line;
14. Protection of generator bus bars;
15. Protection of dividing transformer;
16. Protections of auxiliary service transformers (1, 2, 3, 4 and 5);
17. Control of 10 kV bus section breakers taking into consideration of automatic synchronization;
18. Control of 220 and 110 kV airblast circuit breakers, alarm system, 10 kV;
19. Interlocking electromagnet of circuit breakers;
20. 10 kV feeder protections (four connections);
21. Fault alarm of surface and underground parts.