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April 1, 2005

Mr. Berk Gursoy
Senior Transmission Engineer
Great Lakes Power Limited – Transmission Division
2 Sackville Road
Sault Ste. Marie, ON P6B 6J6

Dear Mr. Gursoy

**Re: Algoma Island Load Rejection Scheme – CAA ID# 2005-EX214
Notification of Approval of Connection Proposal**

Thank you for the detailed information that you provided on the proposed Algoma Island automatic load rejection scheme. This scheme is designed to prevent the overloading of the remaining Algoma line for loss of two of the three Algoma lines, or for an outage to one line with the subsequent loss of a second line. Furthermore, this scheme will eliminate the need to take pre-contingency action (customer load curtailment and/or deployment of must-run generation) for one Algoma line out of service in order to respect the next single line contingency.

We have reviewed your documentation and concluded that the proposed load rejection scheme will not have a material impact on the IESO-controlled grid, provided that the requirements stated in the attached System Impact Assessment Report are met.

The IESO is therefore pleased to grant **conditional approval** for the installation of the new equipment. However, since all new special protection systems need to be registered with the Northeast Power Coordinating Council (NPCC), it should be noted that deployment of this scheme may be restricted until this process is complete.

Any material changes to your proposal may require a re-assessment by the IESO in accordance with Market Manual 2.10, and may nullify your conditional approval.

Provided that the proposed modifications meet OEB's Transmission System Code, **final approval** will be granted upon successful completion of the IESO Facility Registration process.

During facility registration you will be expected to demonstrate that the project you have installed is materially unchanged from the proposal assessed by the IESO. You will also have to provide a Facility Description Document prior to the scheme being deployed, describing both its construction and intended mode of operation. Contact facility.registration@ieso.ca if you have not received a Facility Registration Summary package within the next 10 days.

To commence the construction process, you are advised to follow the necessary procedures and obtain the required approvals, licences and permits as may be required by the OEB and other regulatory authorities.

For further information, please contact the undersigned.

Yours truly,



Bob Gibbons

Manager - Long Term Forecasts & Assessments

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CONNECTION ASSESSMENT & APPROVAL PROCESS

System Impact Assessment Report

Project: Algoma Island Load Rejection Scheme

Applicant: Great Lakes Power Inc.

CAA ID 2005-EX214

Draft Report

Long Term Forecasts & Assessments Department
Consistent Information Set Department

March 2005

Disclaimers

IESO

This report has been prepared solely for the purpose of assessing whether the connection applicant's proposed connection with the IESO-controlled grid would have an adverse impact on the reliability of the integrated power system and whether the IESO upon completion of both parts of the System Impact Assessment should issue a notice of approval or disapproval of the proposed connection under Chapter 4, section 6 of the Market Rules.

Approval of the proposed connection is based on information provided to the IESO by the connection applicant and Hydro One(s) at the time the assessment was carried out. The IESO assumes no responsibility for the accuracy or completeness of such information, including the results of studies carried out by Hydro One(s) at the request of the IESO. Furthermore, the connection approval is subject to further consideration due to changes to this information, or to additional information that may become available after the approval has been granted.

If the connection applicant has engaged a consultant to perform connection assessment studies, the connection applicant acknowledges that the IESO will be relying on such studies in conducting its assessment and that the IESO assumes no responsibility for the accuracy or completeness of such studies including, without limitation, any changes to IESO base case models made by the consultant. The IESO reserves the right to repeat any or all connection studies performed by the consultant if necessary to meet IESO requirements.

Approval of the proposed connection means that there are no significant reliability issues or concerns that would prevent connection of the proposed facility to the IESO-controlled grid. However, connection approval does not ensure that a project will meet all connection requirements. In addition, further issues or concerns may be identified by the transmitter(s) during the detailed design phase that may require changes to equipment characteristics and/or configuration to ensure compliance with physical or equipment limitations, or with the Transmission System Code, before connection can be made.

This report has not been prepared for any other purpose and should not be used or relied upon by any person for another purpose. This report has been prepared solely for use by the connection applicant and the IESO in accordance with Chapter 4, section 6 of the Market Rules. The IESO assumes no responsibility to any third party for any use, which it makes of this report. Any liability which the IESO may have to the connection applicant in respect of this report is governed by Chapter 1, section 13 of the Market Rules. In the event that the IESO provides a draft of this report to the connection applicant, the connection applicant must be aware that the IESO may revise drafts of this report at any time in its sole discretion without notice to the connection applicant. Although the IESO will use its best efforts to advise you of any such changes, it is the responsibility of the connection applicant to ensure that the most recent version of this report is being used.

System Impact Assessment Report

Algoma Island Load Rejection Scheme

1.0 General Description

As shown in Figure 1, St. Patrick TS and Steelton TS are connected to Third Line TS via three 115 kV lines, Algoma #1, #2 and #3.

Assuming a 118 kV voltage, the continuous ratings of each line are:

Summer (30 C)	Winter (10 C)
110 MVA	130 MVA

The short term emergency ratings are slightly higher than the continuous ratings.

These lines supply the Algoma 115 kV island (comprised mainly of industrial load in the Sault Ste Marie area), which includes the following load and generation facilities:

Load		Generation	
ASI (including LMF)	140 MW (15-min peak) 200 MW (instantaneous peak)	LSP GS	100 MW
St. Mary's Paper	55 MW	Clergue GS	50 MW
GP Flakeboard	16 MW		

When local generation is in service, up to 120 MW of Algoma load needs to be supplied via Algoma #1, #2, and #3 lines.

When LSP GS is out of service, the supply deficiency in the Algoma 115 kV island may reach 220 MW, which if concurrent with the loss of two Algoma lines, exceeds the rating of a single Algoma line. This potential configuration has lead to difficulties in obtaining outages to one Algoma line without either curtailing customer load or deploying must-run generation to ensure a single contingency on one of the remaining lines does not result in overload of the other line remaining in service.

To prevent such configuration from occurring without curtailing load or deploying must-run generation, the applicant proposes a load rejection scheme that will allow maintenance work on these circuits while respecting the next single contingency, as stipulated by the IESO. It will also prevent overloading of the remaining circuit in case of a double-circuit contingency.

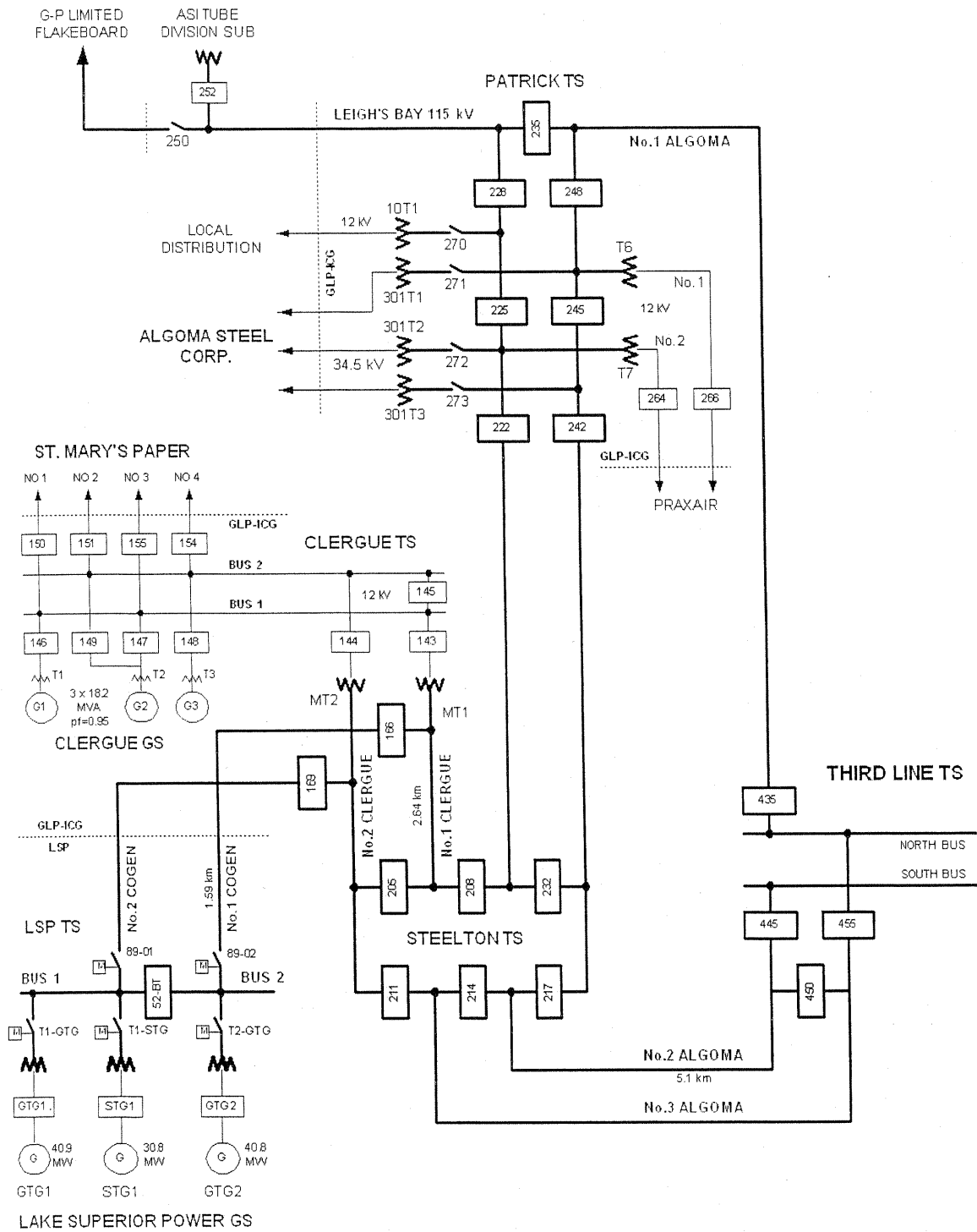


Figure 1: Great Lakes Power System (extract)

2.0 Proposed Facilities and Functional Operation

The proposed L/R scheme, shown in Figure 2, is independent of the load rejection/shedding schemes installed at Third Line TS and the majority of its logic is installed at Steelton TS.

The scheme has inputs from Third Line TS, Patrick TS and Steelton TS that provide the status of the line breakers and, where applicable, line-disconnect switches. These inputs provide monitoring of the line end open (LEO) status at each line terminal.

A logic relay (SEL351S) will be installed at Steelton TS to monitor the inputs to the scheme and operate when any two of the three lines are out of service. In this case at least one load block is to be armed.

The logic scheme includes the following inputs:

- One input for No.1 Algoma LEO at Third Line TS – breaker 435 open;
- One input for No.2 Algoma LEO at Third Line TS – breakers (445 + 450) open or disconnect switch 447 open;
- One input for No.3 Algoma LEO at Third Line TS – breakers (450 + 455) open or disconnect switch 457 open
- One input for No. 2 Algoma and No.3 Algoma LEO at Third Line - breakers (445 + 455) Open;
- One input for each breaker (235 and 248) at Patrick St. TS associated with No.1 Algoma line – two inputs;
- One input for each breaker (211, 214 and 217) at Steelton TS associated with No.2 or No.3 Algoma lines – three inputs;
- One input from the SCADA RTU for arming each of four load blocks – four inputs.

The Third Line TS inputs are sent to Steelton TS/Patrick TS using the existing A protection current differential relays (SEL311L) for the three Algoma lines via fiber optic circuits. For this part of the scheme, each input is sent on all three line differential relays so if one relay on a line or two relays on different lines are out of service the scheme will still function. All other parts of the scheme are not duplicated.

To control the amount of load reduction, the proposed scheme provides the flexibility of arming up to four distinct load blocks in priority sequence via the SCADA system. In normal mode of operation, the scheme is armed from the master SCADA. However, when the master SCADA is not operating, the load blocks can also be armed locally, using the switches on the 351SEL logic relay. Whenever a local switch is in armed position, an alarm is sent to the IESO control room to indicate that the L/R scheme is armed locally. Local arming will only be used if the load blocks cannot be armed via the master SCADA.

The four load blocks are:

1. Patrick St. TS 115kV breakers 228 and 235 (Leigh's Bay – ASI Tube and G-P Flakeboard)
2. Patrick St. TS 12kV breakers 266 and 264 (No.1 & No.2 PRAXAIR) and 115kV breakers 225 and 228 (10T1 12kV)
3. Clergue T.S. breakers 150, 151, 154 and 155 (No.1, No.2, No.3 & No.4 Paper 12kV feeders)
4. Patrick St. TS 115kV breakers 225, 248, 222 and 242 (301T1, 301T2, 301T3, T6 and T7 34.5kV load plus PRAXAIR12kV load)

As shown in Figure 3, the logic of the load rejection scheme initiates a load block trip only if the following two conditions are detected:

- 1) The load block is armed either remotely (via master SCADA) or locally (using the switches on the logic relay); and
- 2) Two of the three Algoma lines are open at either Third Line TS and/or at Patrick St. TS /Steelton TS.

3.0 Assessment and Conditions

The proposed L/R scheme is expected to improve the post contingency operating conditions in the area and, if adequately operated, it will not adversely impact the reliability of the IESO-controlled grid.

The IESO's concern is related to the effects that over-rejection and under-rejection might have on system voltage. Using operational telemetry recorded at its end, the IESO has calculated the values in the following table, which provides the amount of MW that may potentially be reduced by tripping each of the four load blocks:

	Block 1	Block 2	Block 3	Block 4
Average	18	25	44	86
Min	3	23	13	55
Max	36	30	55	137

The next table shows the amount of load that needs to be tripped for various generator outage conditions when two of the Algoma lines are out of service:

Generators o/s		Load reduction requirement
LSP GS	Clergue GS	
X		Up to 100 MW
	X	Up to 50 MW
X	X	Up to 150 MW

Depending on the actual MW consumption in the Algoma island, selecting the combination of blocks that provides the exact load reduction desired might be difficult and over-rejection or under-rejection may occur. Rejecting more/less load than required may result in an unacceptable increase/decrease in voltage at Third Line TS. Moreover, the initiation of the L/R scheme may cause voltage variations outside the acceptable limits for line switching operations.

The IESO considers that the proposed project will not adversely affect the reliability of the IESO-controlled grid if the following requirements are met:

1. the applicant confirms through adequate system studies that the initiation of the proposed L/R scheme will not result in a voltage change greater than 10% of the steady state RMS value and that voltage at Third Line TS is maintained within the range specified in Appendix 4.1 of the market rules; and
2. the applicant demonstrates that the scheme and the associated operating procedures allow the IESO to direct the operation of the L/R scheme, including the arming of the four load blocks, as required by section 8.2 of the market rules.

PATRICK ST. IS

SIBBLTON IS

THIRD LINE IS

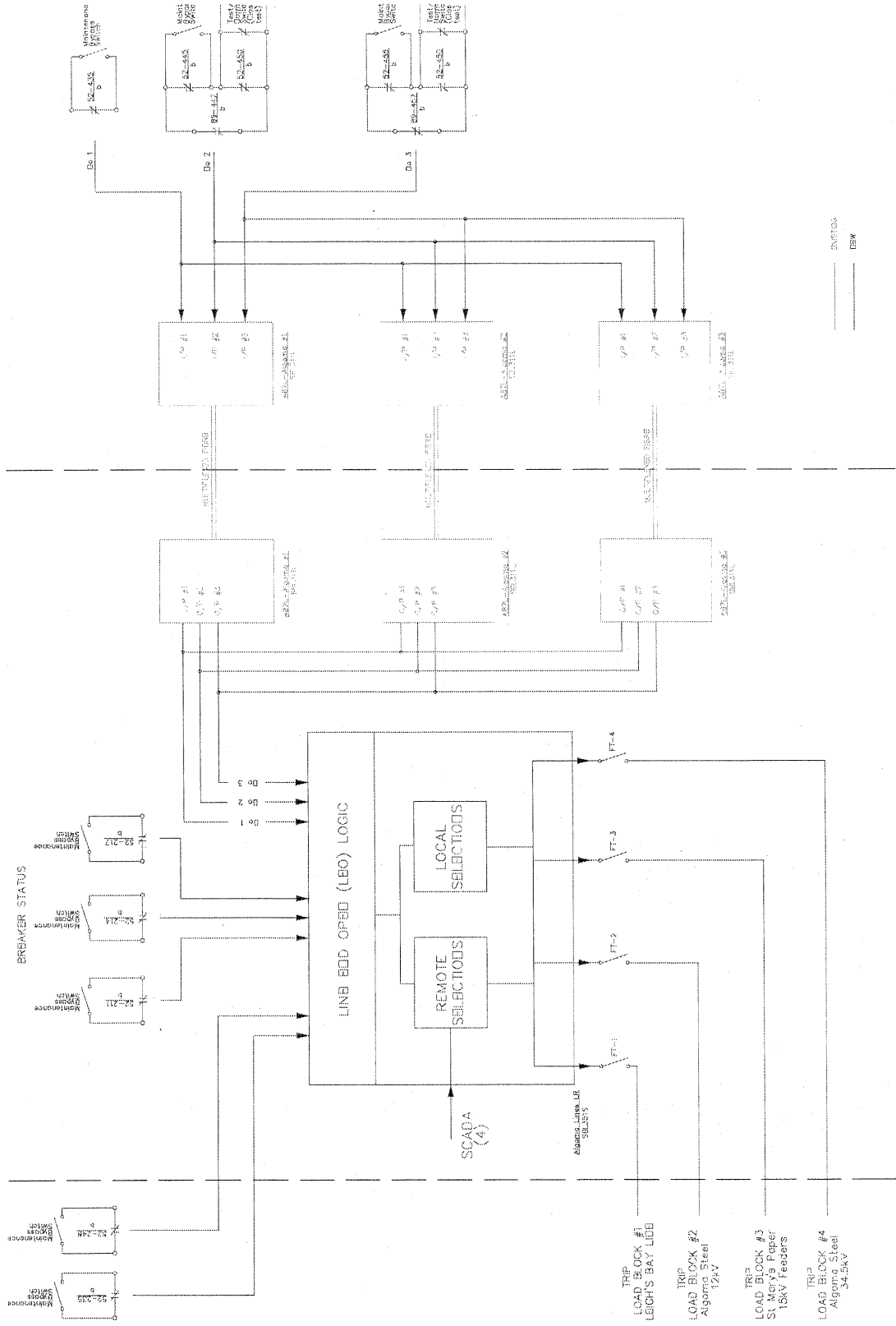


Figure 2: Overview of the Algoma automatic L/R scheme

4.0 NPCC Registration

With the issuing of the Notification of Approval to connect, the IESO will commence the process of registering the proposed L/R scheme with NPCC. Until this process is complete, there may be restrictions on the initiation of the L/R scheme.

5.0 Notification of Approval

The IESO recommends that a Notification of Approval be issued for this project, provided that the applicant meets the conditions listed in section 3.

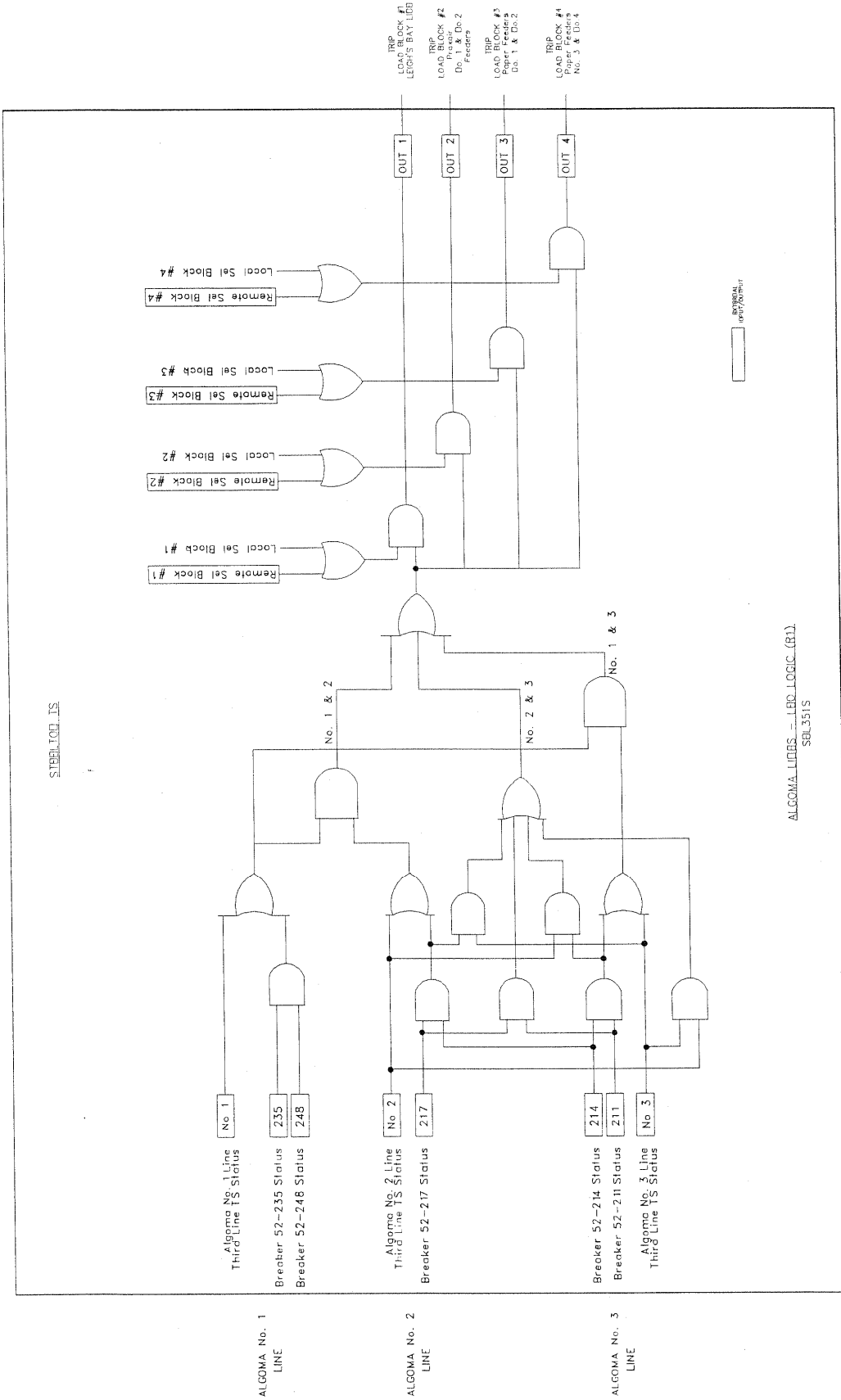


Figure 3: L/R scheme logic diagram