PART VII:
Scheduling and Dispatch Codes

SDC2: CONTROL, SCHEDULING AND DISPATCH

By :

KANNAPRAN PARAMASIVAM – TENAGA NASIONAL BERHAD

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KeTTHA
KEMENTERIAN TENAGA, TEKNOLOGI HIJAU DAN AIR

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The Malaysian Grid Code Awareness Programme Funded by Akaun Amanah Industri Bekalan Elektrik (AAIBE)

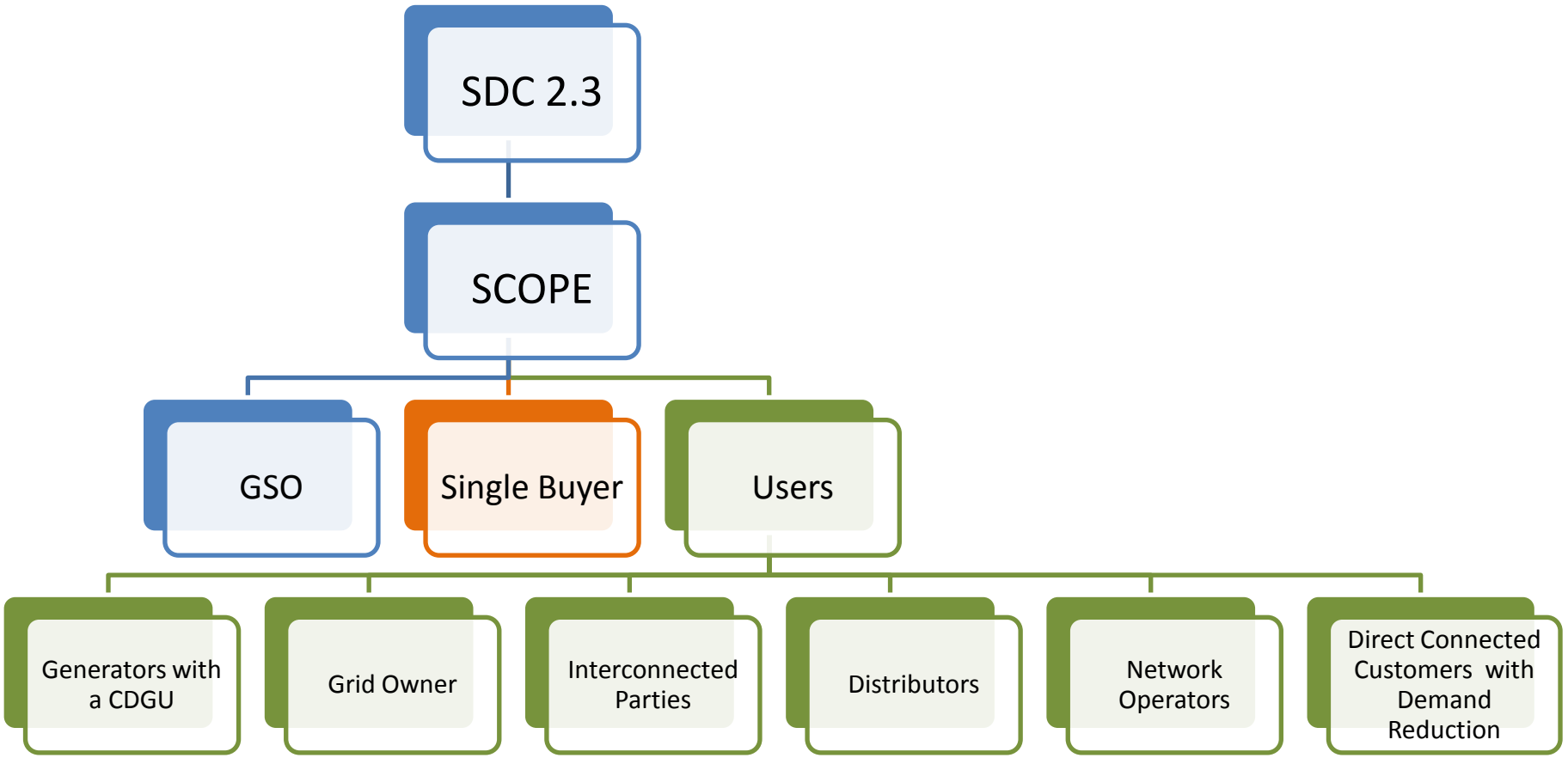
SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.1
	INTRODUCTION
	Sets procedure for the GSO: 1. **Issue Dispatch instructions** to Power Producers relating to • Generating units • Supplementary Services 2. **Optimize overall Transmission System** operations

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.2
	OBJECTIVES
	To guide GSO on issuance of Dispatch instructions to Power Plants and Interconnected Parties; • utilizing the **Least Cost Generation Schedule** derived from SDC1, • with an appropriate **margin of reserve**, • maintaining the **integrity of the Transmission System** • ensuring **security of supply**.
	It also provides the GSO to **re-optimize** the Generation Schedule **as required** in the reasonable opinion of the GSO in real time.

SDC2: Control, Scheduling and Dispatch



SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.4
	PROCEDURE
SDC 2.4.1 Information used	The information which the GSO shall use in assessing which CDGUs to dispatch will be: • The **Least Cost Generation Schedule**; • Changes to any **parameters used** in the derivation of the Least Cost Generation Schedule (e.g. fuel, transmission constraints); • The provision of **Supplementary Services and its parameters** used in the derivation of the Least Cost Generation (e.g. syn-con operation, power factor, spinning reserve); and • Planned **transfer levels** across Interconnectors (EGAT and SPG)
	• **Actual performance in real time** of Generators, Externally Interconnected Parties and Network Operators.

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.4
	• **Variation between forecast and actual demand** also effects Dispatch.
	• If two or more CDGUs have submitted **identical information,** the GSO will select the particular CDGUs on **a random basis.**
	But GSO may **revise the selection of CDGUs** if it result in, • reduction in **transmission losses** • higher **system reliability** and • enhanced **fuel security**.

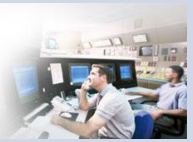
SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.4
SDC 2.4.2 Re-optimisation of Generation Schedule	The GSO is allowed to **revise the Least Cost Generation Schedule** to be as optimal as possible when, in its reasonable judgement, a need arises, e.g. • Tripping of generators/ forced outages • Fuel constraint • Transmission constraint and etc. **No prior notice** given for this re-optimization.
	It is a requirement that Generators always inform the GSO and Single Buyer **of any changes in Availability** Declarations, Generation Scheduling and Dispatch Parameters **immediately.**

LEAST COST GENERATION SCHEDULE

Date	23 July 2013																							
Day	Tuesday																							
TIME	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
LOAD	13164	12516	12126	11749	11542	11497	11618	11437	11875	13648	14496	15087	15042	14838	15277	15580	15566	15063	14127	13990	14424	14635	14356	14033	163843
EGATAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EGATDC	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-360
SPORE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUFG	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	660
CUFK	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	360
JMAH_U1	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	8400
JMAH_U2	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	8400
JMJG_U1	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	8280
JMJG_U2	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	8280
JMJG_U3	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	8280
TBIN_U2	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	7560
TBIN_U3	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	7560
PKLG_U5	350	350	350	350	350	350	350	460	460	460	460	460	460	460	460	460	460	460	460	460	460	460	460	460	5135
PKLG_U3	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	3360
PKLG_U4	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	3000
YPGS	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	4608
YPKA_BLK1	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	4608
YPKA_BLK2	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	384	4608
PGLA_BK11	360	360	250	250	250	250	250	250	250	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	3935
PGLA_BK12	360	360	250	250	250	250	250	250	250	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	3935
TJGS_BK1A	353	353	333	144	111	111	111	111	202	353	353	353	353	353	353	353	353	353	353	353	353	353	353	353	3557
TJGS_BK1B	353	353	333	144	111	111	111	111	202	353	353	353	353	353	353	353	353	353	353	353	353	353	353	353	3557
PKLG_U1	252	140	140	140	140	140	140	140	140	247	282	282	282	282	282	282	282	282	196	201	281	282	282	268	2693
PKLG_U2	155	140	140	140	140	140	140	140	140	252	282	282	282	282	282	282	282	282	282	140	282	282	282	263	2657
KLPP_BK13	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	2628
KLPP_BK14	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	2628
KLPP_BK15	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	2628
SGRI_BK21	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2606
SGRI_BK22	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2606
SGRI_BK23	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2606
SGRI_BK11	217	217	217	217	170	155	196	99	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2479
SGRI_BK12	217	217	217	217	170	155	196	99	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2479
SGRI_BK13	217	217	217	217	170	155	196	99	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2479
PLPS_BK11	217	169	122	122	122	122	122	122	122	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2245
PLPS_BK13	217	169	122	122	122	122	122	122	122	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	2245
PGPS_BK3A	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	1650
PGPS_BK3B	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	1650

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	DISPATCH INSTRUCTIONS
SDC 2.5.1 Issue and Variation	Dispatch instructions - **issued at any time** of that Schedule Day. 
	Dispatch Instructions • directed to Power Plant Control Room Operator 
	However, **electronic signals** via SCADA, would be sent **directly** to the generating unit. (AGC, AVQC, etc)
	A dispatch instruction may be **subsequently cancelled or varied**, including an instruction for a Cancelled Start.
	The GSO may issue Dispatch instructions for **any declared available CDGU** even it was **not included** in the **Generation Schedule.**

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
SDC 2.5.2 Scope of Dispatch Instructions for CDGUs	Dispatch instructions issued are mainly related to **Dispatch of Active Power.** It may also include;
	1. **Notice to Synchronise** – notice to Synchronise or De-Synchronise CDGUs in a specific timescale;
	2. **Active Power** Output (MW)
	3. **Supplementary Services** (AGC, Spinning Reserve)
	4. **Reactive Power** (MVAr)

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	5. **Frequency Sensitive Mode** – Primary response, secondary response. (Free governor mode)
	6. **Maximum Generation** at designed level.
	7. **Future Dispatch** Requirements - a reference to any implications for future Dispatch requirements (normally automated) and the security of the Transmission System. (Special protective scheme – DHIS)
	8. **Intertrips** - an instruction to switch into or out of service an Operational Intertripping scheme. (FGTS)

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	9. **Abnormal Conditions** - instructions relating to abnormal conditions, such as adverse weather conditions, or high or low System voltage, operation under System islanding conditions.
	10. **Tap Positions** – instructions requesting for a CDGU to change tap position.
	11. **Tests** - an instruction to carry out tests. (Monitoring test, Blackstart test and etc)
	12. **Synchronous condenser mode** - operation of a synchronised hydro unit.

SDC2: Control, Scheduling and Dispatch

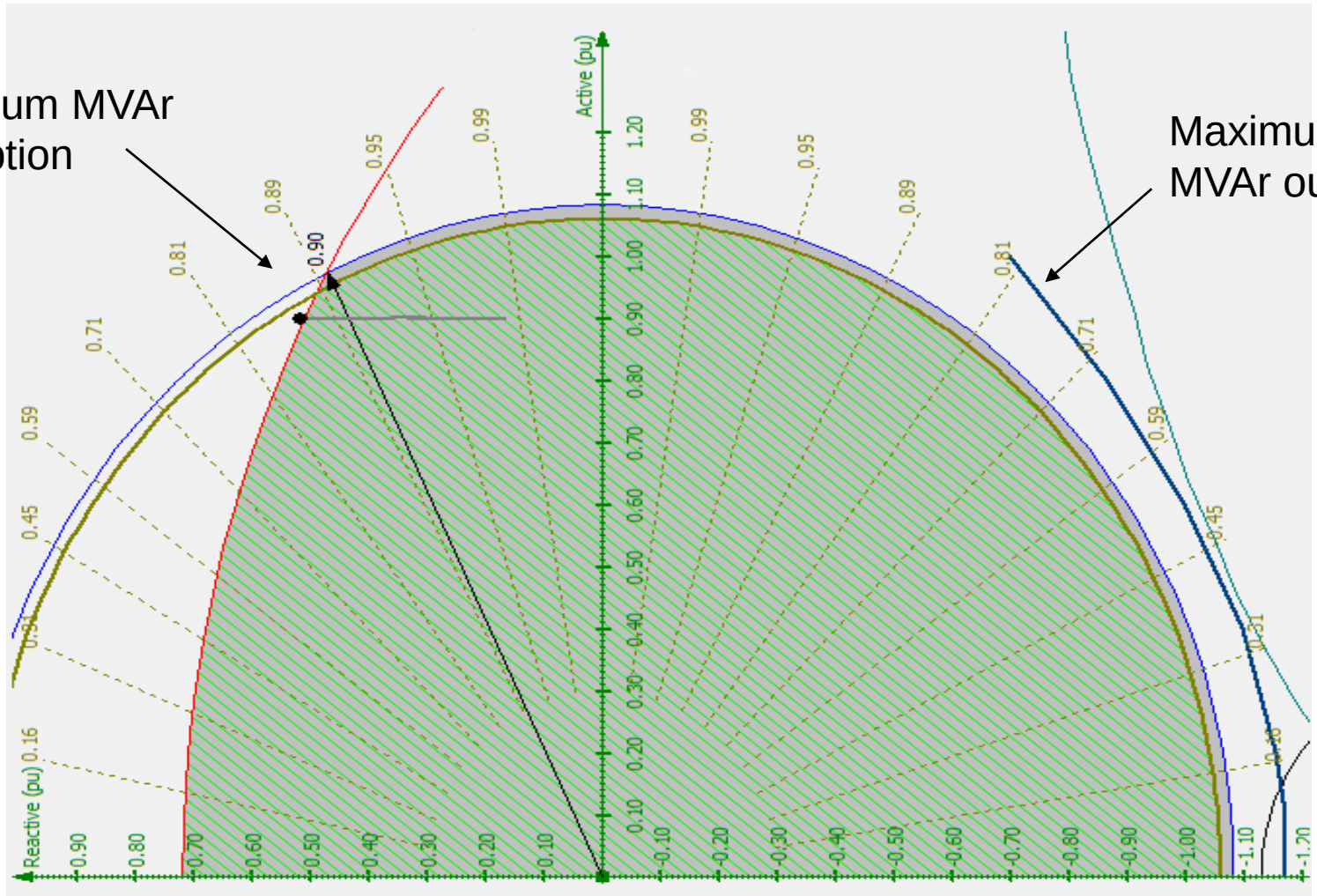
CODE	SDC 2.5
Reactive Power Scope of instructions	To ensure a **satisfactory System voltage** profile and **sufficient Reactive Power reserves** are maintained, a range of voltage control instructions given by the GSO;
Voltage security	1. **MVAr Output** - the individual MVAr output. e.g. Increase/decrease CDGU U1 Reactive Power to 100 MVAr export or import
	2. **Target Voltage Levels** - target voltage levels to be achieved. The CDGU must achieve that target within **a tolerance of "±1 kV**.
	3. **Tap Changes** - details of the required generator step-up transformer tap changes. Must be effected as soon as possible, and in any event **within one (1) minute** of receipt from the GSO of the instruction.

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	4. **Maximum MVAr Output ("maximum excitation")** - as defined by the generator capability chart.
	5. **Maximum MVAr Absorption ("minimum excitation“)-** as defined by the generator capability chart.
	6. Dispatch instructions for **reduction in Active Power** generation to enable an **increase in Reactive Power capability**
	7. The excitation system must be operated only in its **constant terminal voltage mode** of operation with VAR limiters in service.
	8. In events of System voltage change, excitation system would automatically response for increase in MVAr and Generator shall **not override the response**.

SDC2: Control, Scheduling and Dispatch

Reactive Capability Curve of a CDGU



SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	9. A dispatch instruction relating to Reactive Power will be **implemented without delay.** **Unless** it violates the **Stability Limits** or constrained by plant operational limits or on safety grounds (relating to personnel or plant)
	10. When a new MW Dispatch instruction issued, MVAr output shall **remain constant** unless there is a new MVAr Dispatch instruction.
	11. When an instruction to Synchronise or De-Synchronise is given, a MVAr Dispatch instruction consistent with the CDGU's relevant parameters may be given. In absence, the MVAr output should be **0 MVAr** during the **Synchronise or De-Synchronise.**

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	GUIDELINES IN ISSUING DISPATCH INSTRUCTIONS
SDC 2.5.2.2	Dispatch instructions will indicate the **target MW** (at Target Frequency) to be provided **at the Connection Point.**
	Dispatch instructions will be **in accordance with Generation Scheduling** and Dispatch Parameters.
SDC 2.5.2.3	Dispatch instructions will be given **by telephone** (and will include an exchange of operator names) or by automatic logging device or by electronic instruction.
SDC 2.5.2.4	Must be formally **acknowledged immediately** by the Generator. A reason to be given immediately for non-acceptance, which may only be on safety grounds (relating to personnel or plant).

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
SDC 2.5.2.6	In the event that in carrying out the Dispatch instructions, an **unforeseen problem arises**, caused on safety grounds (relating to personnel or plant), the GSO must be **notified without delay** by telephone.
SDC 2.5.2.9	Generators will only Synchronise or De-Synchronise CDGUs to the Dispatch instructions of the GSO or unless that occurs automatically as a result of **intertrip schemes or Low Frequency Relay** operations. De-Synchronisation may take place without prior Agreement of the GSO if it is done purely on **safety grounds** (relating to personnel or plant). If that happens the GSO must be informed immediately that it has taken place.
SDC 2.5.2.11	Any **change or loss** (temporary or otherwise) to the operational capability of the unit must be **notified without delay**, to the GSO by telephone.

SDC2: Control, Scheduling and Dispatch

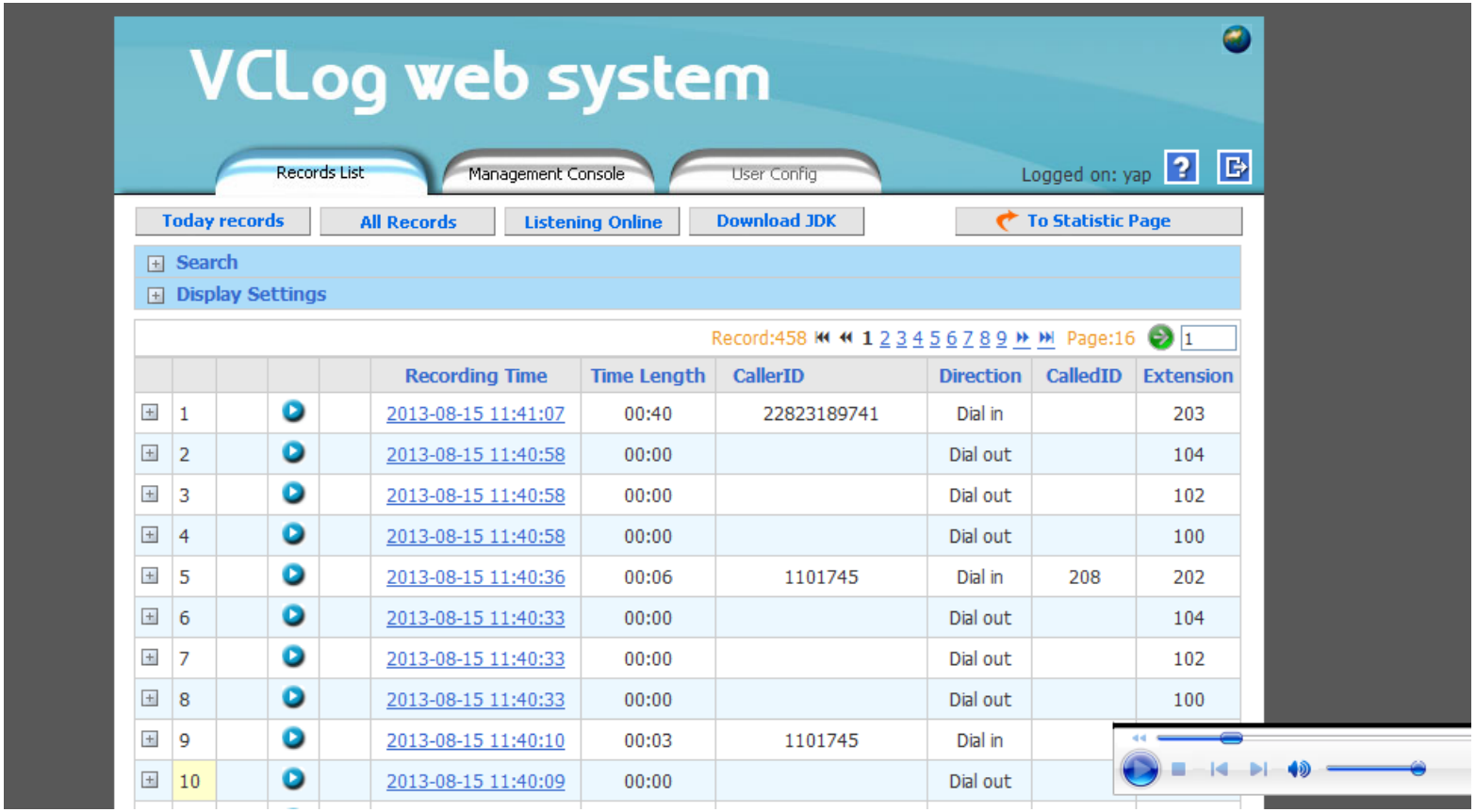
CODE	SDC 2.5
SDC 2.5.2.13	A Generator may request Agreement of the GSO to be operated under a **risk of a trip**. The Agreement will be dependent on the risk to the Transmission System that a trip of the CDGU would constitute.
SDC 2.5.2.14	Where a **power system stabiliser** is fitted as part of an excitation system of a CDGU, it **requires on-load commissioning** which must be witnessed by the GSO. Upon GSO satisfaction, it shall be switched into service and it will be **kept in service at all times** unless otherwise agreed with the GSO.
SDC 2.5.2.15	**GSO agreement** is needed to operate any CDGUs with the **AVR in manual mode**, or power system stabiliser switched out, or VAR limiter switched out.

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
SDC 2.5.2.16	Dispatch instructions may be given by telephone, facsimile or electronic message from the GSO. **Instructions will be recorded** by the GSO in a **written Dispatch log** with the exception of the SCADA set point instructions.
SDC 2.5.2.17	Dispatch logs and any other available forms of archived instructions, shall be kept by all parties. For a **written records** a period not less than **five (5) years** given.
	Voice recordings storage for a period not less than **three (3) months**.

APPENDIX

VOICE RECORDING



SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
SDC 2.5.2.18	If, at any time, the GSO determines that the generating facility may endanger the **personnel** , **System integrity**, **insufficient protective apparatus** or **prevents maintenance** on Grid System's facilities; the GSO will have the **right to disconnect** the generation facility from the Grid System.
	The generating facility will **remain disconnected** until such time as the GSO is satisfied that the condition(s) above has been **corrected**. The GSO shall also **notify the Single Buyer**.

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
SDC 2.5.3 Scope of Dispatch Instructions for Distributors, Network Operators and Directly Connected Customers who Provide Demand Reduction.	Dispatch instructions - **issued at any time** of that Schedule Day.
	Dispatch instructions will recognise **discrete MW blocks available for demand control** and the **notice required** for each discrete MW block to be switched out and subsequently switched back in.
	A Dispatch instruction may **be subsequently cancelled or varied.**

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.5
	The GSO will issue **instructions direct** to the Network Operator, Distributor, or Directly Connected Customer for each demand block available for control.
	If an **unforeseen problem** arises, caused on safety grounds (relating to personnel or plant), the GSO must be **notified without delay** by telephone.

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.6
	REPORTING
SDC 2.6.1	As part of the settlement process, the GSO will provide a report of the actual **real time performance** of each CDGU to the Single Buyer. (Logsheet)
SDC 2.6.2	The GSO shall also provide requisite operational data in a format as specified by the Grid Code Committee /Grid Operation Sub committee to enable them to perform their functions.

APPENDIX

LOGSHEET

TENAGA NASIONAL BERHAD

Daily MW Generation On Tuesday

23-Jul-2013

Station	Unit	0000		0100		0200		0300		0400		0500		0600		0700		0800		0900		1000		1100		1200		1300		1400		1500		1600		1700		1800		1900		2000		2100		2200		2300	
PKLG	U003	284	286	284	286	286	286	281	285	281	285	283	286	284	284	284	287	283	285	285	283	286	284	284	282	282	286	286	284	282	284	282	286	197	201	217	207	147	149	149	147	145	145	147	145	148	147	147	152
PKLG	U004	260	257	259	258	259	258	258	259	256	257	259	258	259	259	258	257	259	260	256	257	257	259	256	257	257	259	256	257	259	259	260	260	260	258	259	263	258	258	258	256	257	260	256	259	258	260	257
PKLG	U005	360	359	359	358	358	360	358	360	360	358	358	359	359	362	374	454	468	464	461	464	461	464	464	461	461	461	464	461	464	468	468	465	465	464	464	464	465	465	462	462	465	465	469	466	466	469	394	330
JMJG	U001	687	686	686	688	687	687	683	687	685	687	685	690	687	686	686	687	684	690	683	686	692	690	686	687	689	687	690	690	688	687	687	690	690	692	689	689	690	689	690	689	689	690	692	690	688	690	690	689
JMJG	U002	690	691	693	690	691	691	688	691	692	687	691	691	688	690	689	688	690	692	688	692	688	687	689	689	690	692	693	689	694	688	691	688	686	692	690	691	686	689	688	693	690	690	688	690	689	693	689
JMJG	U003	690	691	690	693	690	691	688	691	692	687	691	689	688	690	689	688	691	690	699	689	690	689	690	690	688	691	691	691	692	690	696	689	691	688	691	690	689	691	689	694	686	692	690	690	688	689	690	690
TBIN	U002	623	631	630	633	630	631	632	634	631	629	631	632	632	633	630	634	631	632	629	633	629	631	631	633	631	632	631	633	631	631	631	630	632	630	633	632	631	634	630	630	635	632	632	631	630	631	627	628
TBIN	U003	626	631	631	632	633	631	631	634	632	629	629	632	631	634	630	634	632	632	631	633	630	632	631	631	629	631	631	632	632	631	630	632	632	632	632	631	630	634	631	633	631	629	630	630	626
JMAH	U001	702	697	702	702	702	702	702	702	702	701	703	701	701	701	700	705	701	702	701	701	701	700	706	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	703	703	703	703	703	699	700	700
JMAH	U002	702	599	596	601	606	605	599	602	600	600	600	604	702	711	703	703	702	702	698	707	701	701	701	701	701	701	701	708	702	701	701	701	701	701	702	700	703	703	703	699	703	703	704	703	703	703	698	700
Total ST-Coal		**5624**	**5528**	**5530**	**5541**	**5542**	**5542**	**5520**	**5545**	**5531**	**5520**	**5530**	**5542**	**5631**	**5650**	**5643**	**5737**	**5741**	**5749**	**5731**	**5745**	**5735**	**5737**	**5738**	**5732**	**5729**	**5739**	**5747**	**5745**	**5743**	**5740**	**5746**	**5742**	**5654**	**5659**	**5677**	**5665**	**5607**	**5611**	**5601**	**5603**	**5606**	**5608**	**5618**	**5605**	**5604**	**5605**	**5529**	**5461**
PKLG	U001	270	270	246	224	224	224	142	142	142	142	142	142	142	142	142	140	220	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
PKLG	U002	275	276	248	175	141	142	141	142	141	142	142	142	142	141	142	142	142	142	143	224	268	274	271	274	270	266	266	268	268	274	272	272	272	274	274	272	274	274	272	274	272	274	274	274	274	274	274	273
Total ST-Gas		**545**	**546**	**494**	**399**	**365**	**366**	**283**	**284**	**283**	**284**	**284**	**284**	**284**	**283**	**284**	**282**	**362**	**424**	**425**	**506**	**550**	**556**	**553**	**556**	**552**	**548**	**548**	**550**	**550**	**556**	**554**	**554**	**554**	**556**	**556**	**554**	**556**	**556**	**554**	**556**	**554**	**556**	**556**	**556**	**556**	**556**	**556**	**556**	**555**
CBPS	GT1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	78	101	101	102	43	0	0	0	0	0
GLGR	GT01	102	101	102	102	81	64	64	65	65	64	65	64	64	64	66	63	71	103	102	101	101	101	101	100	100	100	100	99	100	99	98	98	99	99	100	100	100	100	101	100	100	101	100	101
GLGR	GT02	107	109	109	109	84	70	72	70	68	70	70	71	71	70	70	70	69	78	109	109	107	107	108	108	108	108	107	107	107	107	106	106	106	106	106	106	107	108	108	108	107	107	108	107	107	107	107	107
GLGR	ST1C	97	97	97	97	85	69	68	69	69	69	69	68	68	68	69	69	69	70	95	96	97	97	97	97	97	96	97	96	96	95	95	95	95	95	95	94	95	96	95	96	96	96	96	96	96	96	96	97
KLPP	GT11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	16	16	18	20	33	33	33	33	32	32	32	32	32	32	32	32	31	31	31	31	31	31	31	31	31	31	31	31	32	32
KLPP	GT12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	10	16	16	16	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
KLPP	GT13	151	147	146	147	136	110	111	68	68	68	67	67	68	68	68	68	98	152	152	153	153	152	157	165	163	163	164	164	163	163	163	151	150	152	151	152	153	151	152	152	152	151	152	152	152	153	153	148
KLPP	GT14	137	137	137	137	128	110	106	66	65	65	65	66	66	65	66	65	69	142	142	143	142	142	142	153	154	154	154	153	154	153	153	137	137	137	137	137	138	138	138	138	139	137	138	138	138	138	138	139
KLPP	GT15	146	146	146	146	136	109	110	99	69	69	69	70	69	70	68	69	68	152	151	151	151	153	151	151	152	151	152	152	150	151	151	146	145	146	147	146	147	148	147	145	147	147	147	148	147	146	148	149
KLPP	ST17	209	200	204	203	199	184	184	150	134	134	134	132	132	132	132	132	132	207	211	234	238	238	238	240	240	240	242	239	239	239	239	238	234	233	233	231	231	232	232	231	231	232	232	232	232	232	232	233
MPSS	GT01	106	107	95	62	63	64	64	66	65	66	63	66	66	64	63	64	97	108	107	105	104	102	102	103	102	102	100	101	100	100	100	101	101	101	101	101	102	102	103	103	103	104	104	103	104	103	104	103
MPSS	GT02	107	108	94	65	66	66	67	68	66	66	66	68	68	67	67	66	99	107	108	107	106	106	105	105	105	105	105	104	104	104	104	104	104	104	104	104	104	104	105	105	105	105	105	106	106	106	106	106
MPSS	ST01	114	114	105	60	58	57	57	56	57	57	56	56	56	56	57	56	85	112	113	114	114	114	114	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	114	114	115	115	114
PAKA	GT2A	84	85	65	65	65	66	65	66	65	65	64	66	65	65	65	65	64	65	76	66	84	85	85	85	84	84	84	85	85	85	85	85	84	85	84	84	85	62	63	62	63	63	63	63	78	86	84	84
PAKA	GT2B	82	84	65	64	64	64	64	65	64	64	62	65	64	64	64	64	64	64	75	64	84	83	84	83	83	84	83	84	85	82	82	82	84	83	84	83	83	62	61	61	62	62	63	62	76	85	83	83
PAKA	GT2C	87	86	76	75	74	74	74	74	75	75	75	75	74	74	74	75	75	86	76	87	88	88	88	88	88	88	88	87	87	88	88	88	88	87	87	87	74	74	74	74	74	74	76	87	87	87	87	87
PAKA	GT3A	87	87	87	87	87	87	87	88	87	88	88	88	88	88	87	88	87	86	85	85	84	84	84	84	84	84	84	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85	85	86	86	87
PAKA	GT3B	87	86	86	86	86	87	87	87	86	86	86	87	87	87	87	86	86	86	86	84	84	84	83	84	84	83	83	83	83	82	83	83	83	84	84	84	84	84	85	85	85	85	85	84	85	84	84	85
PAKA	ST3C	87	87	87	87	87	87	88	87	87	87	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	87	87	88	88	87	87	88	88	87	87	88	88	88	88	88	88
PAKA	GT4A	82	82	81	82	82	82	82	82	81	82	82	82	82	82	82	82	82	81	81	80	80	80	80	80	80	80	80	80	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81
PAKA	GT4B	81	81	80	80	81	81	81	81	80	80	81	81	81	81	81	80	80	81	80	79	79	79	79	79	80	79	79	79	79	78	79	79	79	80	80	79	80	80	80	80	80	80	80	80	80	81	81	80
PAKA	ST4C	91	91	90	90	91	90	90	91	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	91	91	91
PGLA	GT11	213	227	221	226	226	227	226	226	226	229	227	227	227	224	222	229	188	168	229	227	219	223	228	226	206	228	212	229	229	227	228	228	227	226	226	226	213	207	196	223	220	230	231	232	233	234	234	235
PGLA	GT12	215	226	223	227	226	227	227	225	226	232	227	227	227	226	224	228	190	167	232	229	221	224	227	227	206	229	212	229	229	228	226	233	231	233	233	227	214	207	198	223	222	230	232	233	233	234	234	237
PGLA	ST10	235	240	235	239	239	239	238	238	239	238	238	238	238	237	238	222	208	239	237	242	238	242	244	235	239	230	239	238	245	244	247	248	248	244	240	239	222	222	232	247	249	249	249	250	250	250	251	
PGPS	GT3A	97	99	87	83	84	83	84	83	84	83	82	82	83	83	83	83	83	95	99	99	99	97	97	97	97	96	97	98	96	96	97	97	96	97	97	97	97	83	82	99	100	98	99	99	99	99	97	99
PGPS	GT3B	95	95	88	83	83	84	83	83	83	83	82	83	84	83	83	83	83	95	95	94	93	93	93	93	92	92	92	92	92	92	92	92	92	92	92	92	92	82	82	94	94	94	94	94	94	94	94	95
PGPS	ST3C	93	93	86	79	77	78	78	77	77	79	77	77	77	76	77	77	77	83	92	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	85	78	91	93	93	93	93	93	93	93
SGB3	GT31	122	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SGB3	ST34	62	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SGRI	GT11	123	117	107	107	107	107	108	108	139	128	122	133	119	123	108	121	117	138	138	138	138	138	144	144	142	142	143	143	142	142	147	147	142	142	138	138	138	139	139	139	139	139	139	139	139	139	139	137
SGRI	GT12	127	120	113	113	113	112	112	111	112	138	134	124	137	123	125	111	126	121	138	139	139	139	139	139	139	139	139	139	139	137	137	137	137	138	138	138	138	139	139	138	138	140	140	139	139	139	139	140
SGRI	GT13	123	118	110	110	110	110	110	108	108	136	128	121	134	120	124	108	124	119	138	138	138	137	137	137	137	136	136	137	137	135	135	136	136	137	137	136	136	136	136	137	137	137	137	138	138	137	137	137
SGRI	ST14	211	209	192	195	191	195	196	196	195	221	216	213	217	205	207	195	204	212	220	217	217	218	220	219	215	220	217	217	217	217	218	220	220	218	219	221	220	219	220	219	219	218	218	216	220	221	217	222
SGRI	GT21	126	118	109	109	109	108	108	107	107	133	128	118	129	117	121	107	120	119	133	132	132	131	131	131	131	131	131	131	129	129	130	130	131	131	130	130	131	131	131	131	132	132	132	132	132	132	132	132

SDC2: Control, Scheduling and Dispatch

CODE	SDC 2.7
	EMERGENCY ASSISTANCE INSTRUCTIONS
SDC 2.7.1	**Emergency Instructions** may be issued to DGCUs to preserve the Grid System integrity which may be outside of Generation Scheduling and Dispatch Parameters, for example, be: (a) an instruction to **trip** a CDGU; or (b) an instruction to **Part Load** a CDGU; (c) an instruction to operate at **Maximum Generation**. Generator to use **all reasonable endeavours** to respond, such Emergency Instructions **must be complied without delay**. A refusal may only be given on safety grounds (relating to personnel or plant) and must be notified to the GSO immediately by telephone.

APPENDIX

DISPATCH PARAMETERS BY CDGUs

Power Plant

To: Chief Engineer
Transmission Network Sdn. Bhd.
Fax: 03 -7954 3642

From: Shift Charge Engineer
Fax:
Tel:

DAILY AVAILABILITY DECLARATION

Date: Day:

Unit	Fuel	Machine Status			Min.Gen .(MW)	Min. Notice Time (mins) To		Free gov. Opn. (Yes/No)	Min. Down Time hrs.	Ramp Rates (MW/min)	
		From (hrs)	To (hrs)	MW		Synch.	Shutdown			Up	Down
GT 1	G/D				49	30	17	Y	0	8.5	8.5
GT 2	G/D				49	30	17	Y	0	8.5	8.5
GT 3	G/D				49	30	17	Y	0	8.5	8.5
ST					55	Var.	Var.	Y	0	Var	Var

Comments

Issued by:

Shift Charge Engineer

THANK YOU

KeTTHA
KEMENTERIAN TENAGA, TEKNOLOGI HIJAU DAN AIR

Suruhanjaya Tenaga

The Malaysian Grid Code Awareness Programme Funded by Akaun Amanah Industri Bekalan Elektrik (AAIBE)