STATOR WEDGE TIGHTNESS TEST

METHOD

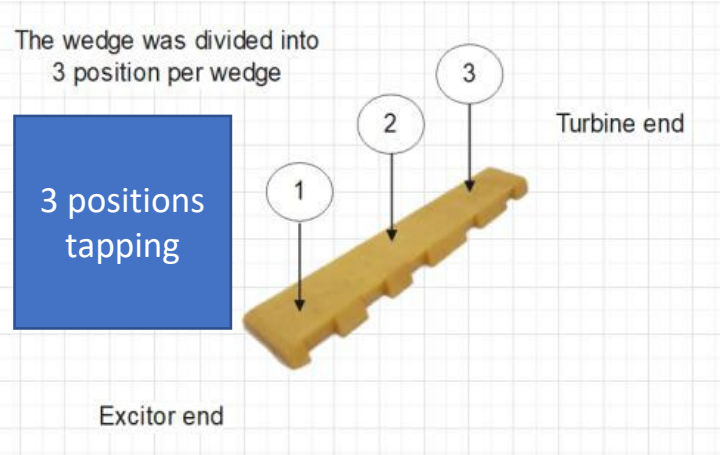
CRITERIA

JOB REFERENCE LIST

Testing Method

- ☐ Robotic/handheld instruments
- ■ ECO Tip Hardness
- ☐ Manual/Sound

ECO Tip hardness method is widely used to measure stator wedge tightness.



Slots were numbered starting at slot number 1 at NDE. Each wedge was tapped three location (3 times tapping) at the middle, and once each side of middle, recording the individual values then average of the three values.

The Diagnostic Criteria Table

Wedge Type	Tight	Partial Loose	Loose
End/Exit Wedges	≥ 650 Leeps	649-550 Leeps	≤ 549 Leeps
Slot/Body Wedge	≥ 650 Leeps	649-550 Leeps	≤ 549 Leeps

The good typical replacement wedge criteria are:

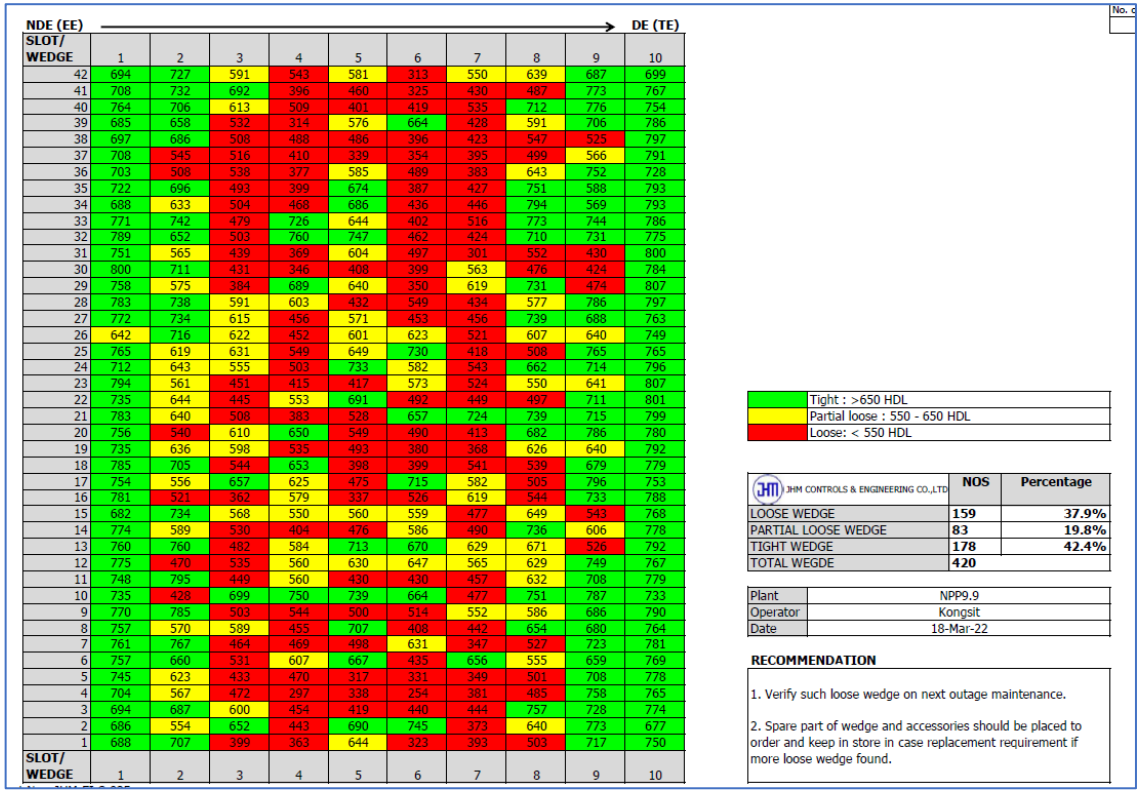
- Loose stator end wedges
- More than 25% loose wedges in slot
- More than 2-3 loose wedges in slot, depending on number and length of the wedge
- More than 25% of all wedges loose

Decisions below should be considered when wedge required to replace:

- Individual wedges
- Individual slot
- Complete stator winding wedges
- Some case, resin may be considered to apply

Equipment and Mapping

Stator wedge tightness tester



NDE (EE) → DE (TE)

SLOT/ WEDGE	1	2	3	4	5	6	7	8	9	10
42	694	727	591	543	581	313	550	639	687	699
41	708	732	692	396	460	325	430	487	773	767
40	764	706	613	509	401	419	535	712	776	754
39	685	658	532	314	576	664	428	591	706	786
38	697	686	508	488	486	396	423	547	525	797
37	708	545	516	410	339	354	395	499	566	791
36	703	508	538	377	585	489	383	643	752	728
35	722	696	493	399	674	387	427	751	588	793
34	688	633	504	468	686	436	446	794	569	793
33	771	742	479	726	644	402	516	773	744	786
32	789	652	503	760	747	462	424	710	731	775
31	751	565	439	369	604	497	301	552	430	800
30	800	711	431	346	408	399	563	476	424	784
29	758	575	384	689	640	350	619	731	474	807
28	783	738	591	603	432	549	434	577	786	797
27	772	734	615	456	571	453	456	739	688	763
26	642	716	622	452	601	623	521	607	640	749
25	765	619	631	549	649	730	418	508	765	765
24	712	643	555	503	733	582	543	662	714	796
23	794	561	451	415	417	573	524	550	641	807
22	735	644	445	553	691	492	449	497	711	801
21	783	640	508	383	528	657	724	739	715	799
20	756	540	610	650	549	490	413	682	786	780
19	735	636	598	535	493	380	368	626	640	792
18	785	705	544	653	398	399	541	539	679	779
17	754	556	657	625	475	715	582	505	796	753
16	781	521	362	579	337	526	619	544	733	788
15	682	734	568	550	560	559	477	649	543	768
14	774	589	530	404	476	586	490	736	606	778
13	760	760	482	584	713	670	629	671	526	792
12	775	470	535	560	630	647	565	629	749	767
11	748	795	449	560	430	430	457	632	708	779
10	735	428	699	750	739	664	477	751	787	733
9	770	785	503	544	500	514	552	586	686	790
8	757	570	589	455	707	408	442	654	680	764
7	761	767	464	469	498	631	347	527	723	781
6	757	660	531	607	667	435	656	555	659	769
5	745	623	433	470	317	331	349	501	708	778
4	704	567	472	297	338	254	381	485	758	765
3	694	687	600	454	419	440	444	757	728	774
2	686	554	652	443	690	745	373	640	773	677
1	688	707	399	363	644	323	393	503	717	750
SLOT/ WEDGE	1	2	3	4	5	6	7	8	9	10

	Tight : >650 HDL
	Partial loose : 550 - 650 HDL
	Loose: < 550 HDL

JHM CONTROLS & ENGINEERING CO.,LTD	NOS	Percentage
LOOSE WEDGE	159	37.9%
PARTIAL LOOSE WEDGE	83	19.8%
TIGHT WEDGE	178	42.4%
TOTAL WEGDE	420	

Plant	NPP9.9
Operator	Kongsit
Date	18-Mar-22

RECOMMENDATION

1. Verify such loose wedge on next outage maintenance.

2. Spare part of wedge and accessories should be placed to order and keep in store in case replacement requirement if more loose wedge found.

Wedge tightness mapping

Stator wedge inspection

Although Equotip Leeb devices are typically utilized for material hardness testing, there are number of additional application possibilities especially for verification and comparator measurement purposes.

Safety aspects and the high dependency of modern day life on electricity dictate the carrying out of thorough health check regimes to verify a generator's performance. Checking the tightness of the stator wedges is an extremely important task when it comes to the initial commissioning of a generator, as well as maintaining the efficacy of the system throughout its life cycle.

STATOR WEDGE TIGHTNESS – JOB REFERENCE LIST

SITE	COUNTRY	BRAND	SERVICE	CAPACITY (MVA)
NPS/NPP9	THAILAND	JINAN POWER	Major Overhaul	12.375
AA/NPP11	THAILAND	MITSUBISHI	Major Overhaul	41.125
GPSC SPP2&3/CTG3A	THAILAND	GE	Minor Inspection	50.8
GPSC SPP2&3/CTG2A	THAILAND	GE	Minor Inspection	50.8
Glow SPP11/GT100	THAILAND	Hma	Major Overhaul	50
Glow SPP11/GT200	THAILAND	Hma	Major Overhaul	50
BPMC/LPC/GT12	BRUNEI	BRUSH	Major Overhaul	30.4
BPMC/LPC/GT13	BRUNEI	BRUSH	Major Overhaul	30.4
Glow Energy/GT1A	THAILAND	GEC ALSTHOM	Major Overhaul	45.529
Glow Energy/GT1B	THAILAND	GEC ALSTHOM	Major Overhaul	45.529
Glow Energy/GT1C	THAILAND	GEC ALSTHOM	Major Overhaul	45.529
Nawanakron/NNEG STG10	THILAND	SIEMENS	Major Overhaul	49.412
PPTC STG10	THAILAND	TMEIC	Major Overhaul	44.93

STATOR WEDGE TIGHTNESS – JOB REFERENCE LIST

SITE	COUNTRY	BRAND	SERVICE	CAPACITY (MVA)
Lamchabang BPLC1/GT1	THAILAND	ALSTHOM	Major Overhaul	47.00
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B.Grimm Power (Angthong) BPAT/ST10	THILAND	SIEMENS	Major Overhaul	52.250
SAHA COGEN GTG2	THAILAND	ALSTOM	Major Overhaul	58.824
SAHA COGEN GTG4	THAILAND	ALSTOM	Major Overhaul	55
GLOW CTG 1	THAILAND	GE	Major Overhaul	50.8
GLOW ENERGY GT2B	THAILAND	ALSTOM	Major Overhaul	45.529
GLOW ENERGY GT2C	THAILAND	ALSTOM	Major Overhaul	45.529
โรงไฟฟ้าครบุรี	THAILAND	NISHISHIBA ELECTRIC	Major Overhaul	15
SGN LAMPHUN STG - 1	THAILAND	SHANDONG JINAN	Major Overhaul	9.9
THAI OIL G8053	THAILAND	SIEMENS	Major Overhaul	61.33
THAI OIL G8054	THAILAND	SIEMENS	Major Overhaul	61.33
NPS PP9	THAILAND	HABIN ELECTRIC	Major Overhaul	158.8

STATOR WEDGE TIGHTNESS – JOB REFERENCE LIST

SITE	COUNTRY	BRAND	SERVICE	CAPACITY (MVA)
โรงไฟฟ้าครบุรี	THAILAND	TOYO DENKI	Major Overhaul	8
KLONGLUANG/GT2	THAILAND	BRUSH	Major Overhaul	55.294

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