Diagnostic Cards -Federal Pioneer Reactive

Version 0

Rev.0 December 17, 2009 Cette version est une version préliminaire et temporaire pour **diffusion très limitée**. Cette version fait référence au logiciel DIAC dont le développement est arrêté par Hydro-Québec.

Le logiciel OpenZen - Zensol (issu de nos logiciels existants CbaWin, GenWin, CbvWin, etc., copyright 1992 à 2009) remplacera DIAC totalement à court terme.

Il sera donc nécessaire de réviser et de corriger cette version, en supprimant notamment toutes les références à DIAC et en les remplaçant par les références équivalentes à OpenZen.

Merci de me contacter directement pour tout commentaire (bon ou mauvais), toute nouvelle idée, ainsi que toute suggestion d'amélioration de ce document ou du logiciel OpenZen et ces documents associés, dans le but ultime de l'obtention d'un logiciel et d'une documentation claire et pratique pour vous et tous nos utilisateurs. Tous vos retours d'information seront très appréciées. Vous remerciant par avance pour votre collaboration,

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This version is a draft and temporary version for **limited distribution ONLY**. This version refers to DIAC software whose development by Hydro-Québec is stopped.

The OpenZen – Zensol software (based on our existing softwares CbaWin, GenWin, CbvWin, etc., copyright 1992-2009) will completely replace DIAC in the short term.

This version needs to be reviewed and corrected by Tap-Changer specialists. Among other things, all references to DIAC software will be replaced by their equivalents in the OpenZen Software.

Text in red requires special attention and will be corrected. If you want the original version of this text, please download the French document.

Please do not hesitate to contact me directly for any comment (good or bad), any new idea, or any suggestion regarding the improvement of this document or the improvement of the OpenZen software and any of its related documents, in order to ultimately obtain clear and useful documentations for you and all of our users. All of your feedbacks will be appreciated.

Thank you for your cooperation.

Fouad Brikci, Ph.D. President Zensol Automation Inc. (514)333-3488 ext 223 <u>zensol@zensol.com</u>

Diagnostic Cards

Federal Pioneer Reactive

The following pages consist of diagnostic cards for tap changers (OLTP) of the Federal Pioneer Reactive family. They summarize the main operational problems specific to this family of tap changers.

Each table defines an anomaly that can be detected using vibro-acoustic methods developed thru DIAC software. <u>The cards are prepared for visual analysis of the traces</u> to provide a more thorough diagnostic. They are complementary tools to the report available in DIAC. Each card shows the anomaly as seen on the measured trace, the malfunction of the OLTP associated with this trace, and the necessary adjustment for its repair. A graphical representation of the anomaly as it appears on the trace acquired is also shown.

Table of Contents

Anomalies as seen on the acoustic traces classified by the number of the card:

- **#1** The trace of the current contains an extended braking;
- **#2** The switching occurs too early/late;
- **#3** Significant fluctuations on the trace of the motor current;
- **#4** The trace of the inrush contains oscillations;
- **#5** Noise of the mechanism during its operation; oscillations present throughout the HF trace;
- **#6** Noise of very high amplitude during the switching operation;
- **#7** Noise of very high amplitude during the operation of the inverter.

Anomalies seen on the trace	Problem	Adjustment needed	
The trace of the current contains an extended braking.	Dynamic brake is applied for an abnormally long time.	Adjust and repair the braking system.	
Picher Plandessa Actor BD Affichage Ar Picher Plandessa Actor BD Affichage Ar Dia Section Durinders's Picherler Into Example	OBh50_EN_SERVICE.mdb alyan International Configuration Report Victorian	Concentration	
Mentalization Indentification Identification 6T2 Type de CPC Federal Pioneer TC546B 25,0 - 20,0 - 20,0 - 20,0 - 5,0 - 20,0 - 5,0 - 20,0 - 5,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 2,0 - 20,0 - 3,0 - 20,0 - 3,0 - 20,0 - 3,0 - 20,0 - 3,0 - 20,0 - 3,0 - <	Nom de l'opération Paum da dam 18° Type d'essai BN_SERVICE Nom de l'opération 18° 18°	arrier OPC/Woro 2.0.61 Order 2006-11-15 Charge MW/ On Load arriert Temp. hulle Principale 30 c Complaur dopiration 579:05 Complaur dopira	
4 30,0- 20,0- 10,0- 0,0- 0,0- 1 2 3	4 5 6 7 8 9 10 11 12 Temps (a) Divisions ▼ 14 12 13	han 4 seconds! Normally, it takes about ess than a second.	

Card #1: The trace of the current contains an extended braking

Card #2: The switching	, occurs too	early/late.
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Anomalies seen on the trace	Pr	oblem	Adjustment needed
The switching occurs too early/late. It happens after the end of the motor current during the braking or much too early in the operation.	Desynchronization the braking.	n of the switching with	Synchronize the switching.
CPC Vibro 2.0.b1 6T1_15 nov. 2006_08h Fichier Plan d'essai Action BD Affichage Analyse	44_EN_SERVICE.mdb		The switching takes place after the motor current, luring the braking.
Identification Ouvrir donnee Recherche Imp. Ecran Infe Identification	Configuration	Demarrer Acq. Rapport	Jtilitaire ' CPC Vibro 2.0.b1
6T1	EN	Je diessal	Date 2006-11-15 Charge MW On Load
Type de CPC	No	m de l'opération _{Heure du}	changement Temp. huile Principale 30 C
Federal Pioneer TC546B	1	-18' T 08:45:4	5 Compteur d'opération 61273
25,0- 20	r current	Braking	14 15 16 17 18 19 20 13 21 21 27
0,0			¹² ¹¹ ²³ ¹⁰ ²⁴ ⁹ ²⁵⁻ -8 ²⁶⁻ -7 ²⁷
60,0- බ			6 28 5 29
<u>نہ</u> 50,0	İ		4 3 18 31 3 2 18 32
3 40,0			
8 30,0			Position CPC
20,0-			
10,0-			
0,0-1 2	3 4 5		
	Temps (s)	Linéaire 🤝 🕂 🔁 🖑	

Card #3: Significant fluctuations on the trace of the motor current.



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Anomalies seen on the trace	Problem	Adjustment needed		
`he inrush trace is present	These oscillations can be caused by a	Readjust the contactor or		
n abnormal oscillations,	problem with the contactor that starts	replace the motor if it is		
while the normal inrush	the motor or with the motor itself.	defective. (CRITERIA???)		
ace is generally smooth				
nd stable.				
The inrush is NORMAL on the blue (oscillations are present we motor begins to run).	he red trace benthe	Compressione Conversione Conversione Conversione Charge MAY (or load) Charge MAY (o		

Card #5: Noise of the mechanism during its operation; oscillations present throughout the HF trace.

Anomalies seen on the	Prot	olem	Adjustment needed		
trace					
Noise of the mechanism	A lack of lubricati	on of the drive	Correct the situation by		
during its operation; the	mechanism or an	advanced wear	lubricating or replacing worn		
throughout all the trace of	of the drive mech	anism is present.	parts of observe the OLIF		
			periodically to monitor the		
1117.			problem at nand.		
CPC View 2.0.11 16012_10 mv. 20 Folier Plan desse Action 80 Althouge a intermineter Court assets Nedworks in plane Identification 16012 Type de CPC Federal Pioneer TC5468 30,0- 25,0- 25,0- 10,0- 10,0- 5,0- 10,0-	Configuration	De dessai	Lower CrC Varia 2.6 bit Date 2006-13-30 Charge WV Childed othorgenerit Tents hulle Principale 25C Compteur d'opération 9975 Compteur d'opération 9975		
an i satanatat	Luche Ageneration	will Margune,			
	10.000	1000 100 100 100 100	19		

Card	#6: Noise	of very high	n amplitude	during the s	switching of	operation.
cuiu	1101 HOISC	or very mg	1 ampiltuue	uuring the s		peration.

Anomalies seen on the trace	Problem	Adjustment needed			
The switching shows a noise with very high amplitude compared to normal switching, and compared with other noises on the same switching	This may be due to a problem of the transition of the spring, a problem with the switch mechanism or another cause.	Identify the cause of the problem and repair, by readjustment of the mechanism, changing the much worn parts or the springs.			
CPC Vibro 2.0.h1 23W-T51_M Fider Plan dessa Action B0 Attion	ar 21, 2007_9h23 AM_EH_SERVICE.mdb age Arolyse				
State State Retender Identification 23W-T51 Type de CPC Federal Pioneer TC546 20,0- 25,0- 25,0- 15,0- 10,0- 10,0- 180,0- 120,0- 180,0- 120,0- 180,0- 120,0- 180,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 120,0- 190,0- 100,0- 190,0- 100,0- 190,0- 100,0-	Configuration Configuration Type dessai FN, SERVICE Norn de fopérati Torease only duri Configuration Type dessai FN, SERVICE Norn de fopérati Torease only duri Configuration Configuration Type dessai FN, SERVICE Norn de fopérati Torease only duri Configuration Configuration Type dessai FN, SERVICE Norn de fopérati Torease To	the conversaon of the second s			

Card #7:	Noise	of verv	high am	plitude	during th	ne opei	ration	of the	inverter.
	noise	UIVCIY	mgn am	philude	uui ing u	ic oper	auton		mverter.

Anomalies seen on the		Problem		Adjustment needed		
A noise of very high amplitude during the operation of the inverter.	This defines an a amplitude prese of the inverter. T much carbon in t with the limiting sources.	arc of very high nt during the op This may be due t the oil, or to a pr voltage device,	Ide eration pr to too or oblem or other	Identify the cause of the problem and repair, change or filter the oil, etc.		
CPC Vieno 2.0.11 240 104_Mar 1 Fidee Pan dessa Action 80 Alfichage Interviewen Oxid scale Reduction in 40 Interviewen Oxid scale Reduction in 40	2, 2007, 16-25 PM, EN, STRVICE, and Analyse B. <u>N. Configure</u> Gan No. Configure	lb Internet Second Feed	Notes Sector	Q Highro Gardene Concidence 3 d had		
Weindication 24C-T54 Type de CPC Federal Pioneer TC548 30,0-<		see	Heure du changeverz Term 1205-91 PM Cert 1205-91 PM Cert 10 7,5 0 10 7,5 0 10 7,5 0 10 7,1 0 10 11,1 12,1 13,1 14,1 14,1 14,1 14,1 14,1 14,1 14	Date 2007-05-12 Charge Max Concool p hule Principale 25C npteur d'opération 28812 2 1 0 1R 3R 3R 4R 3R 0R 7R 1R 1 1R 12R 13R 1 13R 1 14 10 10 1 19 10 1 10 10 10 1 10 10 10 10 10 10 10 10 10 10 10 10 10 1		
An arc of very high amplitude is present during the operation of inverter.	the	50 55 60 65 5 Lineater 11 5	10 7,5 HIE 10			