

# التوربين الغازي GAS TURBINE TG 20

دليل التدريب - إجراءات التشغيل

TRAINING MANUAL  
*Operating Procedures*

إعداد وترجمة  
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## دليل التدريب TRAINING MANUAL إجراءات التشغيل Operating Procedures

### المقدمة Introduction :

يحتوي هذا الكتاب على إجراءات التشغيل لـ :

- قبل البدء Pre-start
- البدء Start-up
- الإيقاف Shut-down

للتوربين الغازي نوع ( TG20 ) مع نظام التحكم الجديد سيمنز ( Siemens S7 ) بتقنية جهاز التحكم المنطقي القابل للبرمجة (PLC) Programmable Logic Controller .

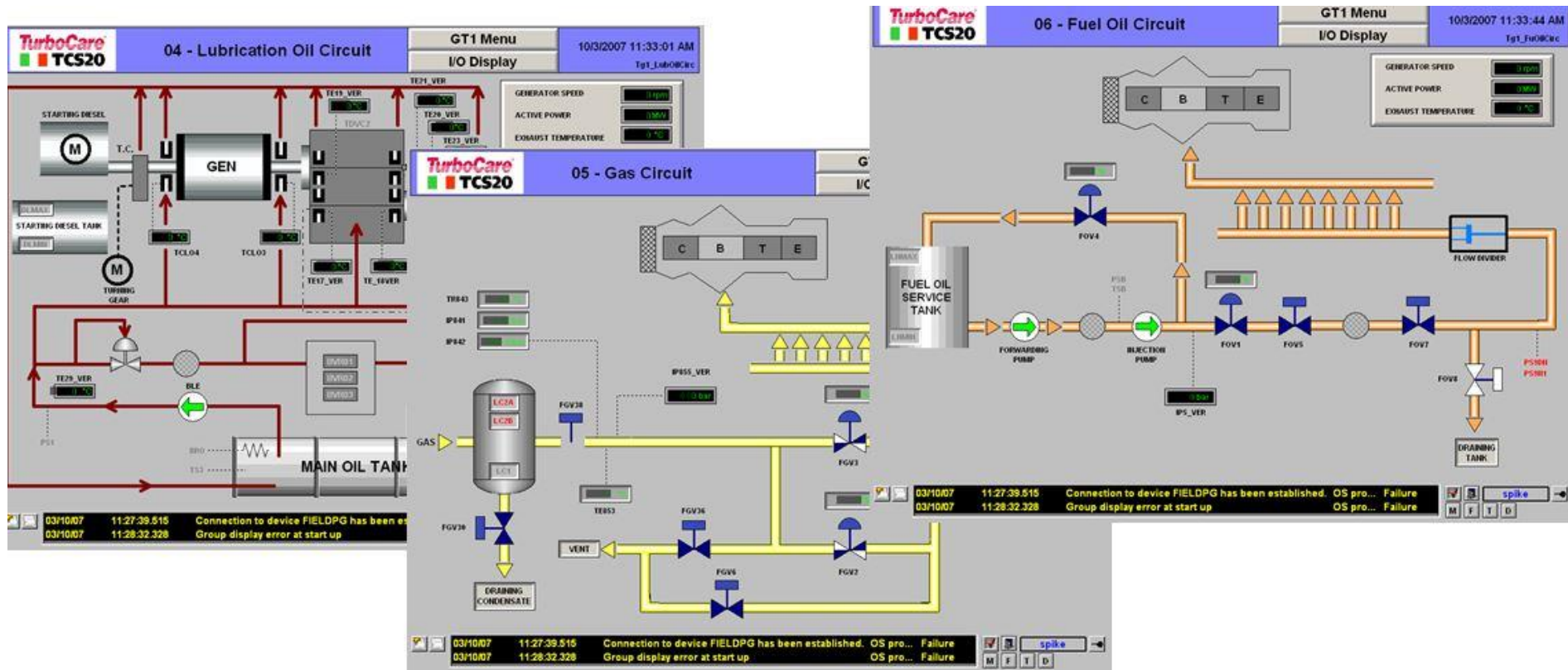
**ملاحظة :** مشغل محطة توليد الكهرباء هو المسؤول عن التشغيل الآمن للتوربين والمكونات الأخرى للوحدة . يجب أن يكون المشغل على دراية تامة بخصائص وحدود تشغيل الوحدة ، وكفاءة جيدة لإتخاذ الإجراءات التصحيحية اللازمة كما هو مطلوب عند حدوث حالة غير طبيعية .





**مدخل إلى الصفحات الشاملة للمحتويات : INTRODUCTION TO SYNOPTIC PAGES**

الغرض من الصفحات العامة هو إظهار جميع مكونات components الوحدة والقيم values وحالات العملية الجارية ، أنها تساعد المشغل لإدارة الوحدة أو المحطة .



: GENERAL DESCRIPTION OF PAGES الوصف العام للصفحات

The screenshot displays the '01 - Menu' screen of the TurboCare TCS20 system. The interface is divided into several sections:

- Header:** TurboCare TCS20 logo on the left, '01 - Menu' in the center, and 'GT1 Menu' and 'I/O Display' on the right. The date and time '10/3/2007 11:31:51 AM' and 'Tg1Menu' are also present.
- Main Menu:** A list of menu items with corresponding function keys:
  - 02 STARTING SEQUENCE (F) FIFO
  - 03 SUPERVISION (T) TRENDS
  - 04 LUBRICATION OIL CIRCUIT (D) DIAGNOSTIC
  - 05 GAS CIRCUIT (A) ACTIVE ALARMS
  - 06 FUEL OIL CIRCUIT (H) HISTORIAN ALARMS
  - 07 AIR CIRCUIT
  - 08 LOAD PARAMETERS
  - 09 FUEL CHANGE-OVER
- Status Bar:** Located at the bottom, it shows system messages:
  - 03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
  - 03/10/07 11:28:32.328 Group display error at start up OS pro... FailureThere is also a 'spike' indicator and a set of function keys (M, F, T, D).

صفحة القائمة الرئيسية Menu

**TurboCare**  
TCS20

01 - Menu

GT1 Menu  
I/O Display

10/3/2007 11:31:51 AM  
Tg1Menu

02	Number and description	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

رقم ووصف الصفحة

**TurboCare** **TCS20** 01 - Menu GT1 Menu I/O Display 10/3/2007 11:31:51 AM Tg1Menu

02	STARTING SEQUENCE	F	Actual date and time
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure


spike M F T D

الوقت والتاريخ الفعلي


**TurboCare** **TCS20**      01 - Menu      GT1 Menu      10/3/2007 11:31:51 AM  
 I/O Display      Tj1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		

**USER LOG ON**



03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike  M F T D

تسجيل دخول المستخدم USER LOG ON



**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
 I/O Display Tg1Menu

02 STARTING SEQUENCE F FIFO  
 03 SUPERVISION T TRENDS  
 04 LUBRICATION MAGNOSTIC  
 05 GAS CIRCUIT CTIVE ALARMS  
 06 FUEL OIL CI HISTORIAN ALARMS  
 07 AIR CIRCUIT  
 08 LOAD PARAMETERS  
 09 FUEL CHANGE-OVER

System Login

Login

Password


OK Cancel Logout

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

نافذة تسجيل الدخول إلى النظام . سيكون من الضروري إدخال الأسم Login و كلمة السر Password



		01 - Menu		GT1 Menu		10/3/2007 11:31:51 AM	
				I/O Display		Tg1Menu	
02	STARTING SEQUENCE	F	FIFO				
03	SUPERVISION	T	TRENDS				
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC				
05	GAS CIRCUIT	A	ACTIVE ALARMS				
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS				
07	AIR CIRCUIT						
08	LOAD PARAMETERS						
09	FUEL CHANGE-OVER						

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro...	Failure						
03/10/07	11:28:32.328	Group display error at start up	OS pro...	Failure					

تصور مُعبر للمستخدم (spike) User visualization

**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
I/O Display Tg1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		

**TRIP (FIFO)**

**F**

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

. Alarm Page of TRIPS (F) صفحة إشارات التوقف (F)  
FIFO = FIRST INPUT-FIRST OUTPUT أول مدخل - أول مخرج

**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
I/O Display Tg1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		


**TRENDS**

**T**

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

M F T D spike

صفحة الإتجاهات أو المسارات (T) Page of TRENDS (T)

		<b>01 - Menu</b>		<b>GT1 Menu</b>		10/3/2007 11:31:51 AM	
				<b>I/O Display</b>		Tg1Menu	




02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHANGE-OVER		

D

**DIAGNOSTIC**

	03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure	
	03/10/07 11:28:32.328 Group display error at start up OS pro... Failure	

صفحة التمييز أو التشخيص (D) Page of DIAGNOSTIC (D)

**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
 I/O Display Tg1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS

**ACTIVE ALARM LIST** R CIRCUIT

08	LOAD PARAMETERS
09	FUEL CHANGE-OVER

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

Active Alarm List Page صفحة قائمة التنبيهات النشطة

**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
I/O Display Tg1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS

**HISTORICAL ALARM LIST** IT

8	LOAD PARAMETERS
	FUEL CHANGE-OVER

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

صفحة قائمة التحذيرات أو التنبيهات المؤرخة Historical Alarm Page



**TurboCare** **TCS20** 01 - Menu GT1 Menu 10/3/2007 11:31:51 AM  
I/O Display Tg1Menu

02	STARTING SEQUENCE	F	FIFO
03	SUPERVISION	T	TRENDS
04	LUBRICATION OIL CIRCUIT	D	DIAGNOSTIC
05	GAS CIRCUIT	A	ACTIVE ALARMS
06	FUEL OIL CIRCUIT	H	HISTORIAN ALARMS
07	AIR CIRCUIT		
08	LOAD PARAMETERS		
09	FUEL CHAN		


09/05/07	09:54:17.562	TRIP - SPEED FAILURE	Alarm	Alarm Hi
09/05/07	09:54:17.562	TRIP - SPEED CHANNELS FAILURE	Alarm	Alarm Hi

spike

منطقة التنبيه Alarm Area

( عند إكتشاف تحذير ما ، يظهر تاريخ DATE ووقت TIME ووصف DESCRIPTION التحذير )

إعدادات بدء التشغيل : START UP SETTINGS



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDEISATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEHTE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

START

STOP TURBINE

STOP

TDPU

100 sec.

STARTING TURBINE	STOP TURBINE	GENERATOR SPEED
START	STOP	0 rpm
		ACTIVE POWER
		0 MW
		EXHAUST TEMPERATURE
		0 °C

spike

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

الصفحة الرئيسية لتسلسل خطوات أو إجراءات بدء التشغيل Starting Sequence

**TurboCare**  
**TCS20**

**02 - Starting Sequence**

**GT1 Menu**  
**I/O Display**

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
AUT AUTO  
MAN MAN

**SPEED CHANGER**  
UP UP  
DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
AUT ON  
MAN OFF

**FUEL CHANGE-OVER**  
AUT AUTO  
MAN MAN

**AUXILIARY OIL PUMP**  
AUT AUTO  
OFF OFF  
MAN MAN

**GAS VEHTIE VALVE**  
AUT ON  
OFF OFF  
MAN OFF

**EMERGENCY OIL PUMP**  
ON OFF

**AUXILIARY OIL PUMP**  
ON OFF

**OVERSPEED VALVE**  
ON OFF

**FUEL SELECTION**  
GAS CHANGE FUEL OIL

**TEST**  
STARTING TEST  
OVERSPEED TEST  
SPEED DROOP TEST  
SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**  
180 sec.

**STARTING TURBINE**  
START

**STOP TURBINE**  
STOP

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

إختيار أو تحديد نوع الوقود كالغاز GAS

02 - Starting Sequence

GT1 Menu  
I/O Display

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VEITE VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**SPEED DROOP CONTROL**

POWER CONTROL

STARTING TURBINE

STOP TURBINE

TDPU 180 sec.

START	STOP
-------	------

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

لإستخدام وقود مختلف ، أنقل المؤشر إلى زر تغيير (CHANGE) وأضغط لتحديد أو إختيار وقود مختلف .

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tgt\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS4	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT ON  
 MAN OFF

**FUEL CHANGE-OVER**  
 AUT AUTO  
 MAN MAN

**AUXILIARY OIL PUMP**  
 AUT AUTO  
 OFF  
 MAN MAN

**GAS VEITE VALVE**  
 AUT ON  
 OFF  
 MAN OFF

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**  
 POWER CONTROL

**STARTING TURBINE**  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 180 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

إختيار نوع الوقود كزيت الوقود FUEL OIL



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	MAN

GAS VENTIL VALVE

AUT	ON
OFF	OFF
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TDPU

180 sec.
----------

STARTING TURBINE

START

STOP TURBINE

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

TCS Selectors in AUTO تحديد منظومة سيطرة التوربين TCS على الوضع الذاتي



02 - Starting Sequence

GT1 Menu  
I/O Display

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

FD2 SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL BI OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENT VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**TDPU**

180 sec.
----------

**SPEED DROOP CONTROL**

--

**POWER CONTROL**

--

**STARTING TURBINE**

START
-------

**STOP TURBINE**

STOP
------

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure	spike
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure	M F T D

يجب تحديد أو ضبط كل الأوامر التالية على وضع AUTO :

- مغير السرعة SPEED CHANGER . - صمام تصريف الغاز المتكثف DRAINING GAS CONDENSATE VALVE .
- تغيير أو تحويل الوقود FUEL CHANGE-OVER . - مضخة الزيت المساعدة AUXILIARY OIL PUMP . - صمام تنفيس الغاز GAS VENT VALVE .

٢٣

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL III OPEARATION	PS6	PS7B	SPURK-PLUGS	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES	STARTING END

### SELECTORS ON TCS CABINETS SET IN AUTO

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST	OVERSPEED TEST
SPEED DROOP TEST	SIMULATION TEST

SPEED DROOP CONTROL

--	--

POWER CONTROL

--	--

TDPU

180 sec.	
----------	--

STARTING TURBINE

START	STOP

STOP TURBINE

START	STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

spike

يجب ضبط جميع المحددات المادية (الموقعية) physical selectors في كابينة TCS على وضع AUTO .

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS4	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDEISATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VENTIL VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

START

STOP TURBINE

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

الموافقة على تشغيل مركز السيطرة أو التحكم على المحركات M.C.C. Consent  
 جميع المحددات في كابينات M.C.C. (Motor control center) يجب ضبطها على الوضع الذاتي AUTO .

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCB SELECTORS IN AUTO	N.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	S55 CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEHTE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

STOP TURBINE

TDPD

180 sec.

START

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

موافقة بدء التشغيل بمحرك الديزل Starting Diesel Consent  
 يجب ضبط المحدد (بدء التشغيل على الديزل STARTING DIESEL) على الوضع الذاتي AUTO

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	N.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	ON
MAN	OFF

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

TDPU

100 sec.

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

START

STOP TURBINE

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike
M
F
T
D

الموافقة على الإحتراق Combustible Consent



. سماحية إستخدام وقود الغاز Fuel Gas Permissive .  
 تُعطى هذه الموافقة إذا كان (صفحة الفيديو ٥) :  
 - الغاز مُحدد .

- صمام غلق الوقود الغازي (FGV1) Fuel gas shut-off valve مُغلق
- صمام بدء تشغيل الوقود الغازي (FGV2) Fuel gas starting valve مُغلق
- صمام خنق الوقود الغازي (FGV3) Fuel gas throttle valve مُغلق .

. سماحية إستخدام زيت الوقود Fuel Oil Permissive .  
 تُعطى هذه الموافقة إذا كان (صفحة الفيديو ٦) :  
 - زيت الوقود مُحدد .

- صمام خنق زيت الوقود (FOV1) مُغلق .
- هواء التفنيت أو التذرية Atomising air < ١٧ بار .



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

6° and 11° STAGE BY-PASS VALVES OPEN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	MAN

GAS VEITE VALVE

AUT	ON
OFF	OFF
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TOPU

180 sec.
----------

SPEED DROOP CONTROL

START
-------

POWER CONTROL

STOP
------

STARTING TURBINE

START
-------

STOP TURBINE

STOP
------

GENERATOR SPEED

0 rpm
-------

ACTIVE POWER

0 MW
------

EXHAUST TEMPERATURE

0 °C
------

spike

M	F	T	D
---	---	---	---

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

الموافقة على فتح الصمامات الإلتفافية (صمامات التحويل) By-Pass Valves open  
تُعطى موافقة الصمام الإلتفافي للمرحلة ( ٦ ) عندما يكون الصمام ( VBP6 ) مفتوح ( انظر صفحة الفيديو ٧ )  
تُعطى موافقة الصمام الجانبي أو الإلتفافي للمرحلة ( ١١ ) عندما يكون الصمام ( VBP11 ) مفتوح ( انظر صفحة الفيديو ٧ )

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	R.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENT VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**TDPU**

180 sec.

**SPEED DROOP CONTROL**

STARTING TURBINE

START

**POWER CONTROL**

STOP TURBINE

STOP

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

تشغيل محرك التدوير البطيء Turning Gear Motor Running  
تُعطى هذه الموافقة عند تشغيل جهاز التدوير البطيء .

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENT VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

TDPU

180 sec.

**SPEED DROOP CONTROL**

START

**POWER CONTROL**

STOP

**STARTING TURBINE**

START

**STOP TURBINE**

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW


EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

تعشيق مجموعة التروس الخاصة بالفصل والوصل SSS CLUTCH ENGAGED  
 تُعطى هذه الموافقة عندما يكون مفتاح التحديد Limit switch للمفصل SSS مغلق .



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSC CLUTCH ENGAGED	LUBE OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT  AUTO

MAN  MAN

**SPEED CHANGER**

UP  UP

DOWN  DOWN

DRAINING GAS CONDENSATE

**LUBE OIL TEMPERATURE > 21° C**

MAN  MAN

**GAS VERITE VALVE**

AUT  ON

OFF  OFF

MAN  OFF

**EMERGENCY OIL PUMP**

ON  OFF

**AUXILIARY OIL PUMP**

ON  OFF

**OVERSPEED VALVE**

ON  OFF

**FUEL SELECTION**

GAS  CHANGE  FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**TDPU**

180 sec.

**SPEED DROOP CONTROL**

START

**POWER CONTROL**

STOP

**STARTING TURBINE**

START

**STOP TURBINE**

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

الموافقة على درجة حرارة زيت التزييت Lubrication Oil Temperature Consent

تُعطى موافقة درجة حرارة زيت التزييت عندما تكون درجة الحرارة في خزان زيت التزييت < 21 درجة مئوية °C (أنظر صفحة الفيديو ٤) ، إذا لم تتحقق درجة الحرارة هذه ، تحقق من كون المسخنات بالعمل .



**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | **10/3/2007 11:31:23 AM**  
**I/O Display** | **Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSC CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**PRESSURE SWITCH ON OVERSPEED OIL CIRCUIT CLOSED**

EMERGENCY OIL PUMP: ON OFF  
 AUXILIARY OIL PUMP: ON OFF  
 OVERSPEED VALVE: ON OFF  
 FUEL SELECTION: GAS CHANGE FUEL OIL  
 TEST: STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST  
 GENERATOR SPEED: 0 rpm  
 ACTIVE POWER: 0 MW  
 EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

تحديد (PS7)

تُعطى هذه الموافقة عندما يكون مفتاح الضغط Pressure switch على دورة زيت السرعة الزائدة مُغلق .



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	CONDENSIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	GGV CLUTCH ENGAGED	LOWR. OIL TEMP. CONSENT	PSD	PROTECTOR CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENTIL VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**SPEED DROOP CONTROL**

START

**POWER CONTROL**

STOP

**STARTING TURBINE**

START

**STOP TURBINE**

STOP

**TDPD**

180 sec.

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

spike

M F T D

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro..	Failure
03/10/07	11:28:32.328	Group display error at start up	OS pro.. Failure

موافقة الحماية Protection Consent

تحقق من عدم وجود إشارات حماية نشطة أو فعالة على ( صفحة الفيديو TRIP ) .

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	CONDENSIBLE CONSENT	BY-PASS VALVES OPEN	TORNING GEAR MOTOR RUNNING	DIS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PSD	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	ON
MAN	OFF

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VEITE VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

TDPU

180 sec.

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

START

STOP TURBINE

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

عندما يتم التحقق من جميع شروط الموافقة ، تحقق على الشاشة من وجود موافقة بدء التشغيل STARTING CONSENT .

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT AUTO  
 MAN **MAN**

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT ON  
 MAN **OFF**

**FUEL CHANGE-OVER**  
 AUT **AUTO**  
 MAN MAN

**AUXILIARY OIL PUMP**  
 AUT AUTO  
 OFF  
 MAN MAN

**GAS VEITE VALVE**  
 AUT ON  
 OFF  
 MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON **OFF**

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON **OFF**

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 180 sec.


**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

الآن التوربين الغازي gas turbine جاهز لبدء التشغيل .

بدء تشغيل وقود الغاز : FUEL GAS START UP



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	N.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSE CLUTCH ENGAGED	LUBR. OIL TEMP CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EHD

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAINING GAS CONDENSATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEINTE VALVE

AUT	ON
OFF	OFF
MAN	

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

SPEED DROOP CONTROL

POWER CONTROL

POWER CONTROL

TDPU

180 sec.

STARTING TURBINE

START

STOP TURBINE

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C


03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M	F	T	D
---	---	---	---





## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL III OPEARATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDEISATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	MAN

**GAS VEITE VALVE**

AUT	ON
OFF	OFF
MAN	MAN

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**SPEED DROOP CONTROL**

ON
----

**POWER CONTROL**

ON
----

**STARTING TURBINE**

START
STOP

FUEL GAS SELECTED

**TDPU**

180 sec.
----------

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

spike

M	F	T	D
---	---	---	---

التحقق من اختيار الوقود الصحيح (الغاز GAS مثلا)



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SES CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL III OPEARATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF
MAN	MAN

**GAS VEHTE VALVE**

AUT	ON
OFF	ON
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**SPEED DROOP CONTROL**

POWER CONTROL

**STARTING TURBINE**

START

**STOP TURBINE**

STOP

**TDPU**

180 sec.

**GENERATOR SPEED**

0 rpm

**ACTIVE POWER**

0 MW

**EXHAUST TEMPERATURE**

0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

بدء تشغيل التوربين في حالة التوليد Turbine Start Up in Generation ، حدد الزر أبدأ (START)

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF
MAN	MAN

**GAS VEINTE VALVE**

AUT	ON
OFF	OFF
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

STARTING TURBINE

STOP TURBINE

**TDPU**

180 sec.
----------

START
STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

اضغط على موافق (OK) في نافذة التأكيد Confirmation window لتنفيذ الأمر

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	ISS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL III OPEARATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

# MASTER TG ENERGIZED

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAINING GAS CONDENSATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	OFF
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	OFF
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

SPEED DROOP CONTROL

POWER CONTROL

POWER CONTROL

STARTING TURBINE

TURBINE RUNNING

START

STOP TURBINE

STOP

STOP

TDPU

180 sec.

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

spike
M
F
T
D

الآن يتم تفعيل أو تنشيط المرحل الكهربائي الرئيسي MASTER TG relay ENERGIZED

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHAIGER

AUT	AUTO
MAN	MAN

SPEED CHAIGER

UP	UP
DOWN	DOWN

DRAINING GAS CONDEHSATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	OFF
MAN	MAN

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TDPU

180 sec.
----------

SPEED DROOP CONTROL

SPEED DROOP CONTROL
---------------------

POWER CONTROL

POWER CONTROL
---------------

STARTING TURBINE

TURBINE RUNNING
START

STOP TURBINE

STOP
------

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

spike

M

F

T

D

التسخين المسبق لديزل بدء التشغيل STARTING DIESEL IN OPERATION



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL BY OPERATOR	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS COIDEISATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF
MAN	MAN

**GAS VEINTE VALVE**

AUT	ON
OFF	OFF
MAN	MAN

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**COUNT DOWN PURGING TIME**

TDPU

180 sec.

SPEED DROOP CONTROL

TURBINE RUNNING

START

POWER CONTROL

STOP TURBINE

STOP

GENERATOR SPEED: 0 rpm

ACTIVE POWER: 0 MW

EXHAUST TEMPERATURE: 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	spike
03/10/07	11:28:32.328	Group display error at start up	M F T D

وقت العد التنازلي للتطهير أو التنظيف بدء عملية التطهير purging بأدنى سرعة (٣٠٠ دورة في الدقيقة) ولمدة (١٨٠ ثانية)



**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	DES. CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING OVERSPEED IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	S

**Open for 15 sec.**

**SPEED CHANGER**  
 AUT **AUTO**  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT **AUTO**  
 MAN MAN

**FUEL CHANGE-OVER**  
 AUT **AUTO**  
 MAN MAN

**AUXILIARY OIL PUMP**  
 AUT **AUTO**  
 OFF OFF  
 MAN MAN

**GAS VENT VALVE**  
 AUT **ON**  
 OFF OFF  
 MAN OFF

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**  
 180 sec.

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

فتح صمام تنفيس الغاز Gas vent valve (مرحلة البدء) لمدة (١٥ ثانية)

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT **AUTO**

MAN **MAN**

**SPEED CHANGER**

UP UP

DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT **AUTO**

MAN **MAN**

**FUEL CHANGE-OVER**

AUT **AUTO**

MAN **MAN**

**AUXILIARY OIL PUMP**

AUT **AUTO**

OFF **OFF**

MAN **MAN**

**GAS VEINTE VALVE**

AUT **ON**

OFF **OFF**

MAN **OFF**

**EMERGENCY OIL PUMP**

ON **OFF**

**AUXILIARY OIL PUMP**

**ON** OFF

**OVERSPEED VALVE**

ON **OFF**

**FUEL SELECTION**

**GAS** CHANGE FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**

180 sec.

**STARTING TURBINE**

**TURBINE RUNNING**

START

**STOP TURBINE**

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

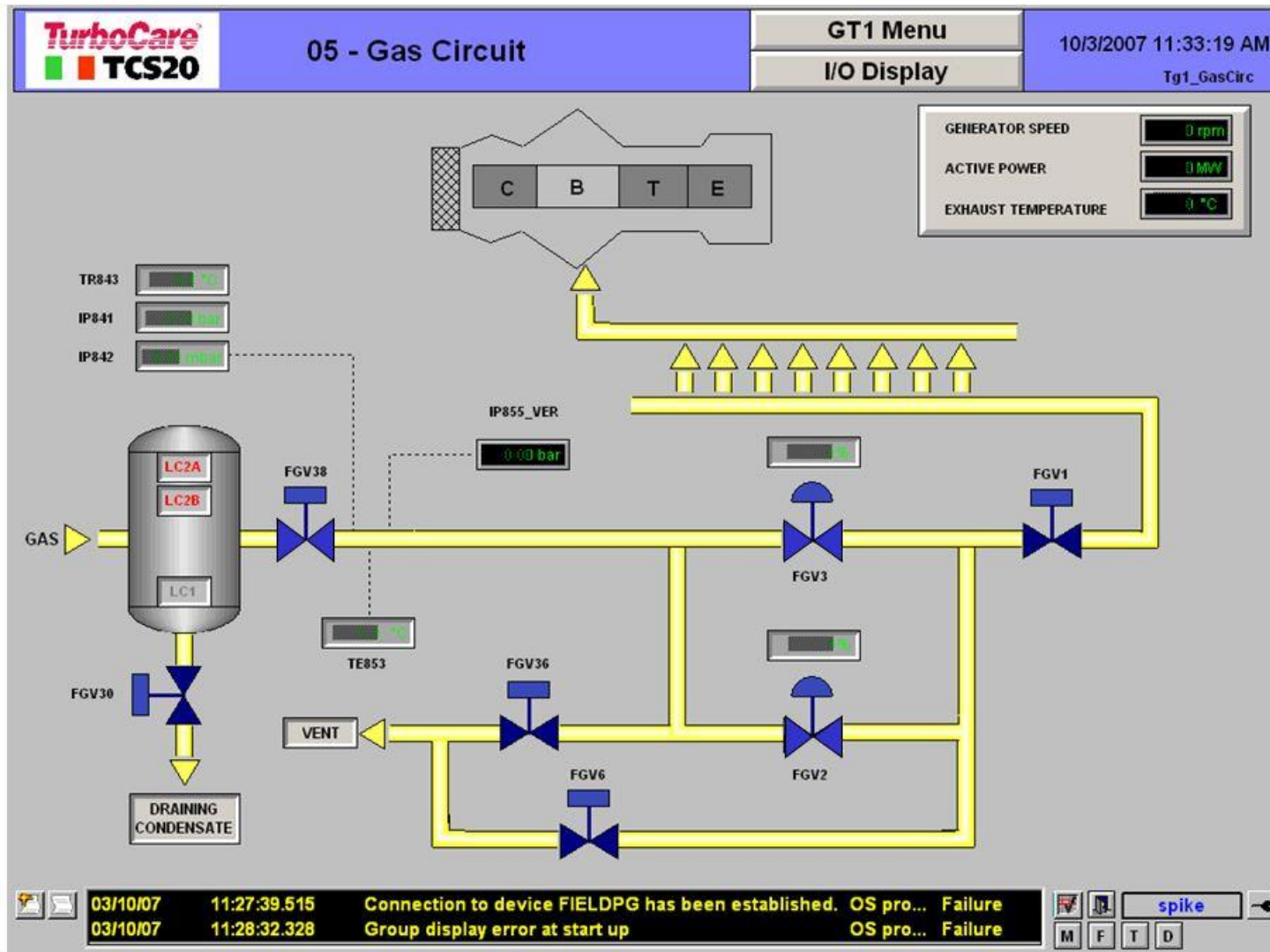
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

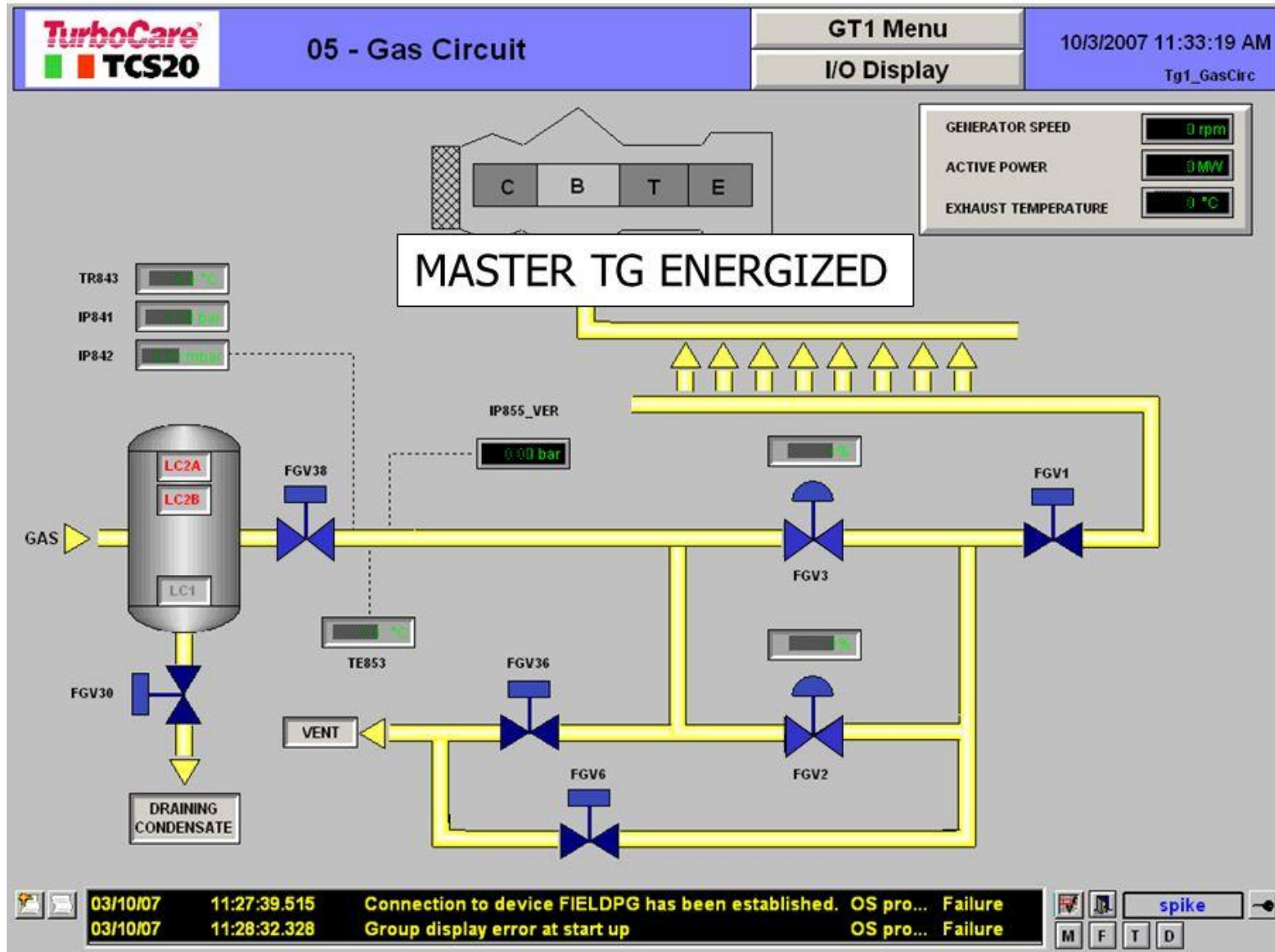
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

بدء تشغيل وقود الغاز (تابع) : FUEL GAS START UP (continue)

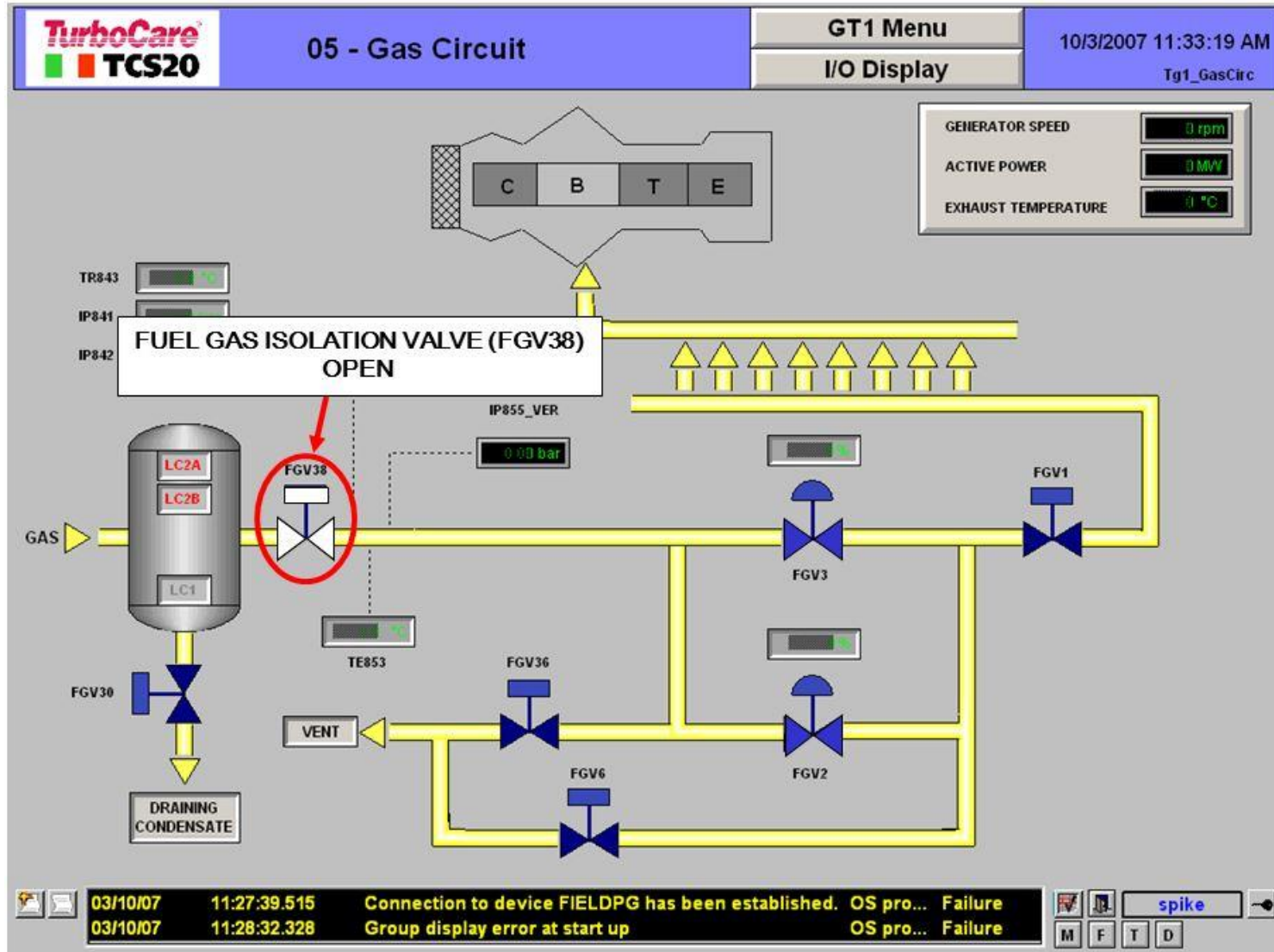


الصفحة الرئيسية لدورة الغاز Gas Circuit



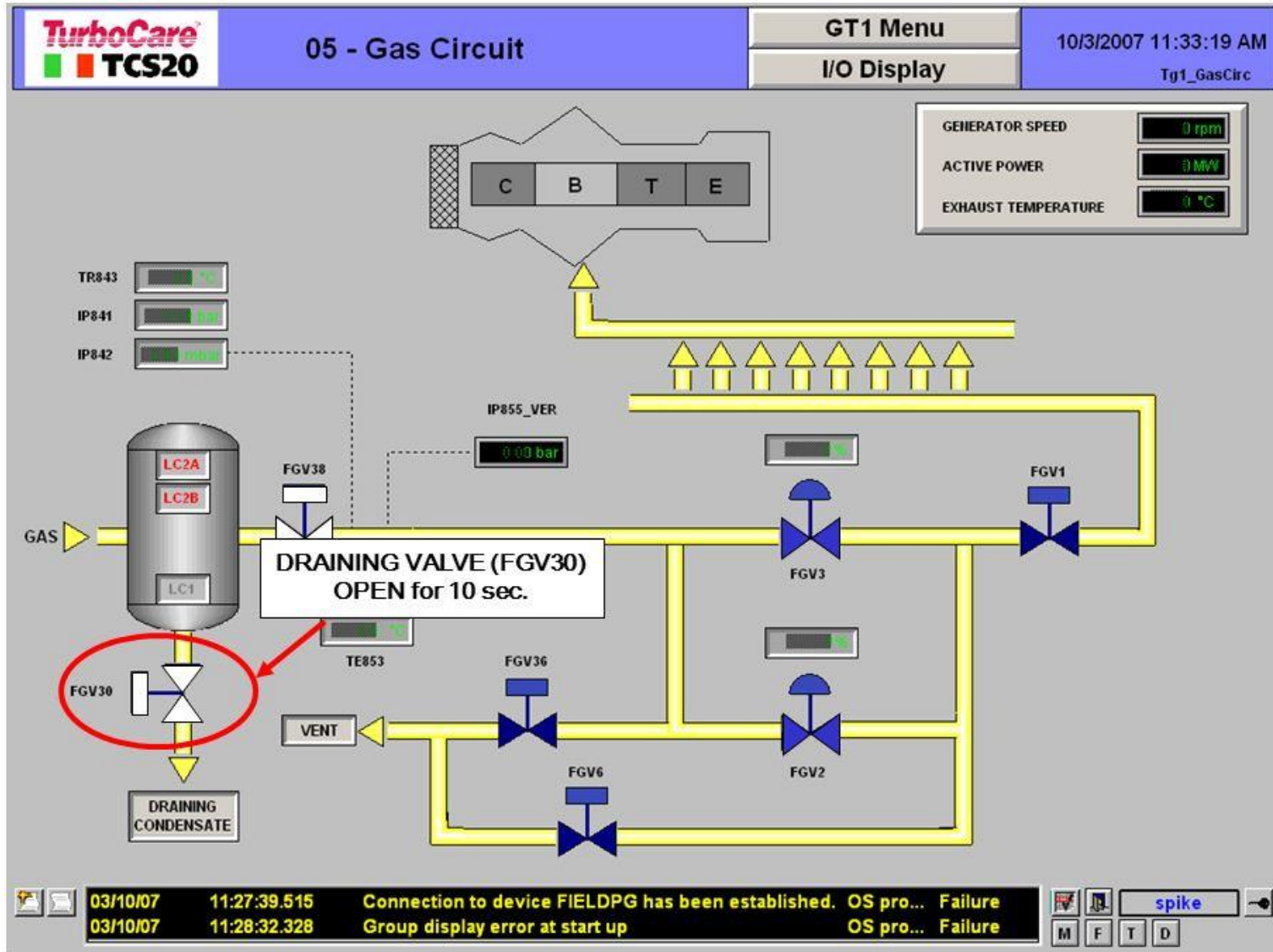
تفعيل أو تنشيط المرحل الكهربائي الرئيسي MASTER TG ENERGIZED



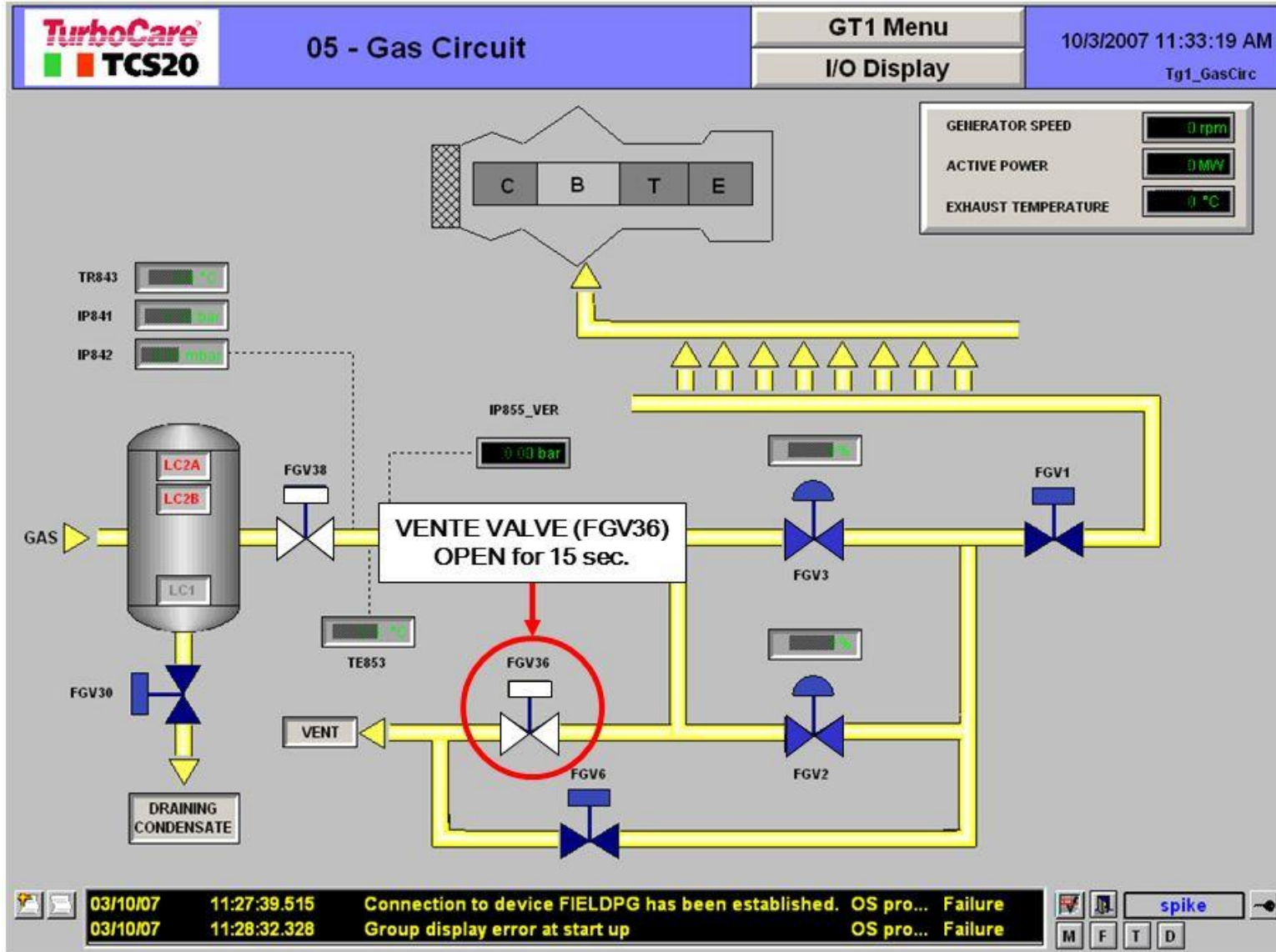


فتح صمام عزل وقود الغاز (FGV38) FUEL GAS ISOLATION VALVE (FGV38)

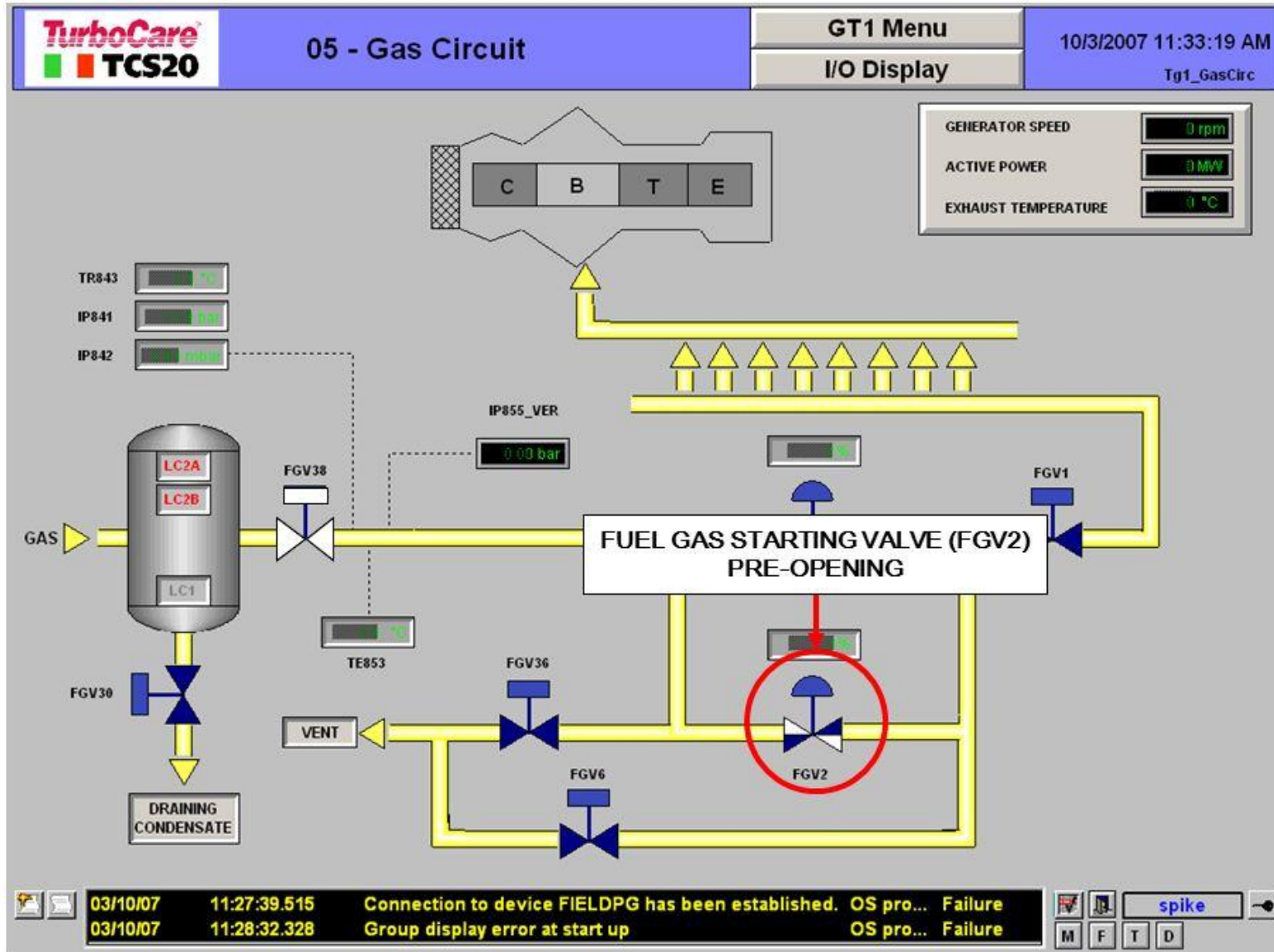




فتح صمام تصريف الغاز المتكثف GAS DRAINING CONDESATE VALVE (FGV30) لمدة (١٠ ثواني)



فتح صمام تنفيس الغاز (FGV36) GAS VENT VALVE لمدة (١٥ ثانية)



الفتحة الأولية (الميكانيكية) Pre-opening لصمام بدء تشغيل وقود الغاز FUEL GAS STARTING VALVE (FGV2) PRE-OPENING

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EHD

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDEHSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF
MAN	MAN

**GAS VENITE VALVE**

AUT	ON
OFF	OFF
MAN	OFF

**EMERGEICY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

300 rpm
SIMULATION TEST

**TDPU**

0 sec
-------

**SPEED DROOP CONTROL**

TURBINE RUNNING
START

**POWER CONTROL**

STOP
------

**GENERATOR SPEED**

0 rpm
0 MW
0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

spike

M	F	T	D
---	---	---	---

السرعة المرجعية للمولدة ( 300 دورة في الدقيقة rpm ) GENERATOR SPEED



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EHD

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF

**GAS VENT VALVE**

AUT	ON
OFF	OFF
MAN	OFF

STARTING DIESEL ACCELERATION

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**TDPU**

180 sec.
----------

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

	03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	spike
	03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

بدء تسارع الديزل حتى بداية الإكتفاء الذاتي Self-sustaining (أي الحد الأدنى لسرعة عمود الضاغط الذي يتم عنده إستمرارية عمل ( تدوير ) التوربين بلا حمل وبدون قوة تحريك وهنا تساوي ١٨٠٠ دورة في الدقيقة)



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PSTB	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EHD

**SPEED CHANGER**

AUT AUTO

MAN MAN

**SPEED CHANGER**

LIP LIP

LD LD

**DRAINING GAS CONDENSATE VALVE**

ALT AUTO

**FUEL CHANGE-OVER**

ALT AUTO

**AUXILIARY OIL PUMP**

ALT AUTO

**GAS VEINTE VALVE**

ALT AUTO

GT SPEED INCREASE UNTIL THERE IS THE CORRECT VALUE OF AIR COMPRESSOR DELIVERY PRESSURE FOR THE IGNITION

**EMERGENCY OIL PUMP**

ON OFF

**AUXILIARY OIL PUMP**

ON OFF

**OVERSPEED VALVE**

ON OFF

**FUEL SELECTION**

GAS CHANGE FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

**STARTING TURBINE**

TURBINE RUNNING

START

**STOP TURBINE**

STOP

TDPU 180 sec.

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

تزداد سرعة التوربين الغازي GT لغاية تأمين القيمة الصحيحة لضغط هواء الضاغطة اللازم لبدء الأشتعال

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENT VALVE**

AUT	ON
OFF	OFF
MAN	

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

600 rpm

SIMULATION TEST

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**

TURBINE RUNNING

START

**STOP TURBINE**

STOP

**TDPU**

180 sec.

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

MFTD

السرعة المرجعية للمولدة (GENERATOR SPEED ٦٠٠ دورة في الدقيقة )

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.I.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PSTB	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TDPU

180 sec.
----------

SPEED DROOP CONTROL

SPEED DROOP CONTROL
---------------------

POWER CONTROL

POWER CONTROL
---------------

STARTING TURBINE

TURBINE RUNNING
START

STOP TURBINE

STOP
------

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

<p style="margin: 0;">03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure</p> <p style="margin: 0;">03/10/07 11:28:32.328 Group display error at start up OS pro... Failure</p>	<p style="margin: 0;">spike</p> <p style="margin: 0;">M F T D</p>
--	---

مفتاح الضغط على الضغط المنجز لضاغطة الهواء في وضع ON (PS6 ، الإعداد أو الضبط عند xx ملي بار mbar)

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	P57	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	P56	P57B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAINING GAS CONDEISATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	MAN

GAS VEITE VALVE

AUT	ON
OFF	OFF
MAN	MAN

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TDPU

180 sec.
----------

SPEED DROOP CONTROL

SPEED DROOP CONTROL
---------------------

POWER CONTROL

POWER CONTROL
---------------

STARTING TURBINE

TURBINE RUNNING
START

STOP TURBINE

STOP TURBINE
STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

مفتاح الضغط على دورة الهواء عند السرعة الزائدة في وضع (PS7B) ON ، الإعداد أو الضبط عند xx ملي بار (mbar)



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TES SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	P57	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	P56	P57B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VENT VALVE**

AUT	ON
OFF	OFF
MAN	

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL

POWER CONTROL

POWER CONTROL

**TDPU**

180 sec.

**STARTING TURBINE**

TURBINE RUNNING

START

**STOP TURBINE**

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

spike

M F T D

صمام السرعة الزائدة OVERSPEED VALVE في وضع ON



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPARK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	MAN

**GAS VEITE VALVE**

AUT	ON
OFF	OFF
MAN	MAN

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**TDPU**

180 sec.
----------

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL
---------------------

**POWER CONTROL**

POWER CONTROL
---------------

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure	
03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

spike
M
F
T
D

بدء تشغيل شمعات الإشعال أو القدح SPARK-PLUGS COMMAND

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	N.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

### AFTER 5 sec.

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

FUEL CHARGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

TDPU

180 sec.
----------

SPEED DROOP CONTROL

SPEED DROOP CONTROL
---------------------

POWER CONTROL

POWER CONTROL
---------------

STARTING TURBINE

TURBINE RUNNING
START

STOP TURBINE

STOP
------

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

بدء تشغيل شمعات الإشعال Spark-plugs (تأخير ٥ ثواني) لمدة ٢٠ ثانية

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURD. FLUIGS DOWNWARD	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

MASTER IGNITION ENERGIZED

**SPEED CHANGER**

AUT **AUTO**

MAN MAN

**SPEED CHANGER**

UP UP

DOWN DOWN

**EMERGENCY OIL PUMP**

ON **OFF**

**AUXILIARY OIL PUMP**

**ON** OFF

**OVERSPEED VALVE**

**ON** OFF

**FUEL SELECTION**

**GAS** CHANGE FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**TDPU**

180 sec.

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**

**TURBINE RUNNING**

START

**STOP TURBINE**

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

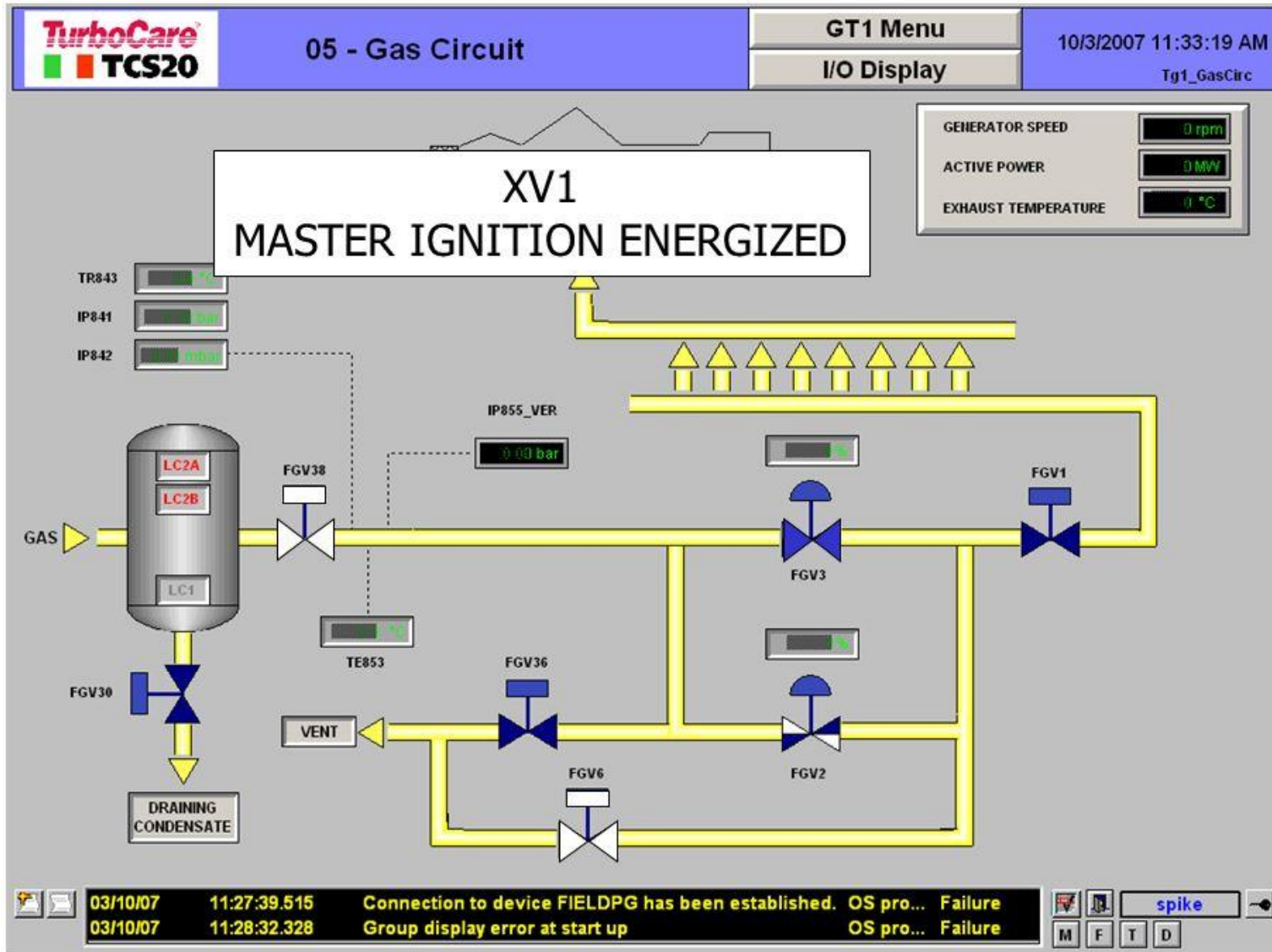
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

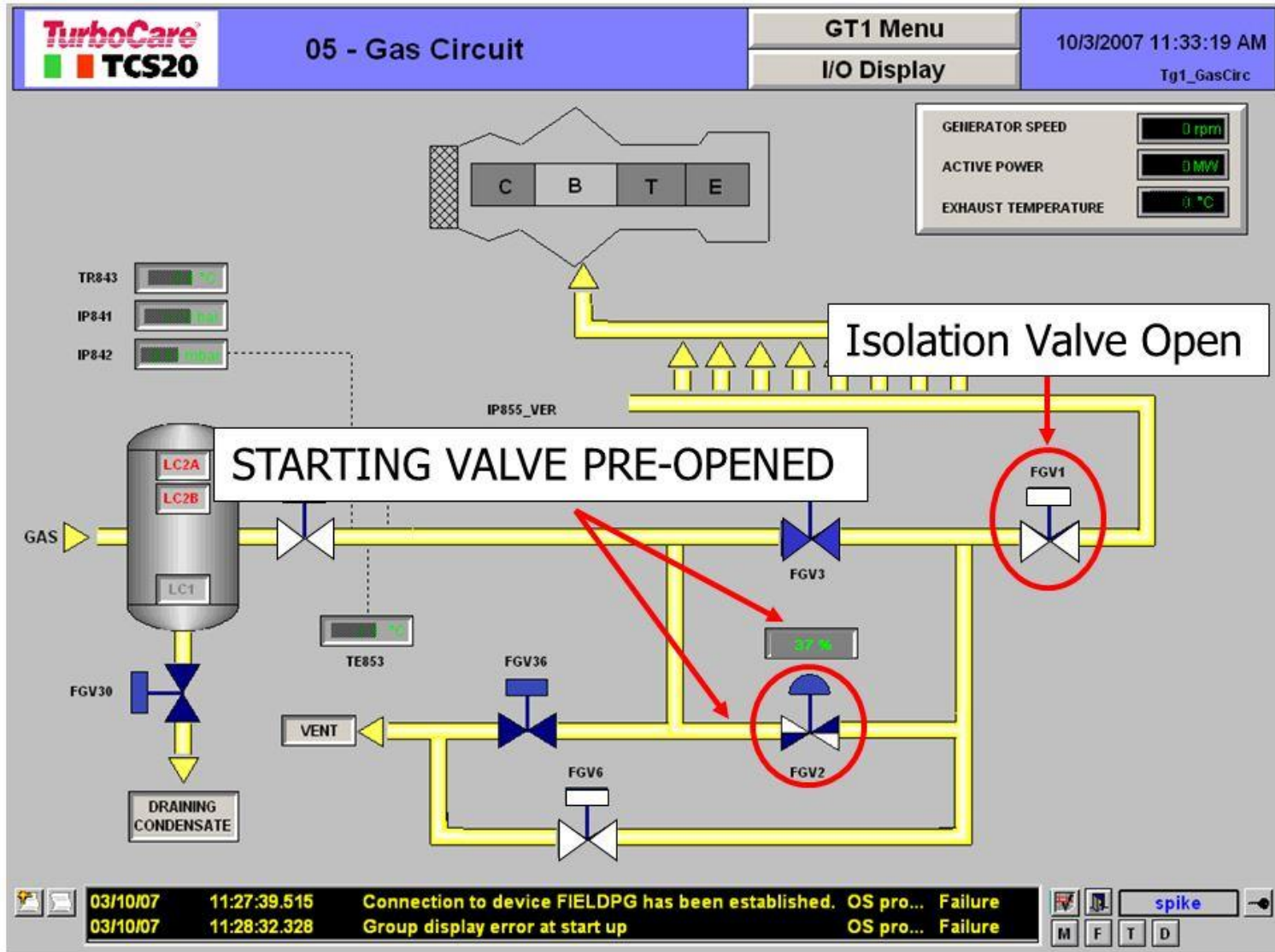
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure
M F T D

تفعيل أو تنشيط الأشتعال (XV1) MASTER IGNITION ENERGIZED



تفعيل أو تنشيط الأشتعال (XV1) MASTER IGNITION ENERGIZED





فتح صمام عزل الوقود الغازي ( FGV1) Isolation Valve Open و الفتح الأولي لصمام بدء تشغيل الوقود الغازي STATING VALVE ( FGV2)PRE-OPENED



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	KV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	OFF
MAN	MAN

**GAS VEHTE VALVE**

AUT	ON
OFF	OFF
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**TDPU**

180 sec.
----------

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**POWER CONTROL**

POWER CONTROL
---------------

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL
---------------------

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro...	Failure
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

spike

تشغيل كاشفات اللهب أو الشعلة (FD1 , FD2 , FD3 , FD4) Flame detectors

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SES CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	P57	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	P56	P57B	SPURK-PLUGS COMMAND	BY1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

**AUXILIARY OIL PUMP**

AUT	AUTO
OFF	
MAN	MAN

**GAS VEINTE VALVE**

AUT	ON
OFF	
MAN	OFF

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**TDPU**

0 sec
-------

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL
---------------------

**POWER CONTROL**

POWER CONTROL
---------------

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

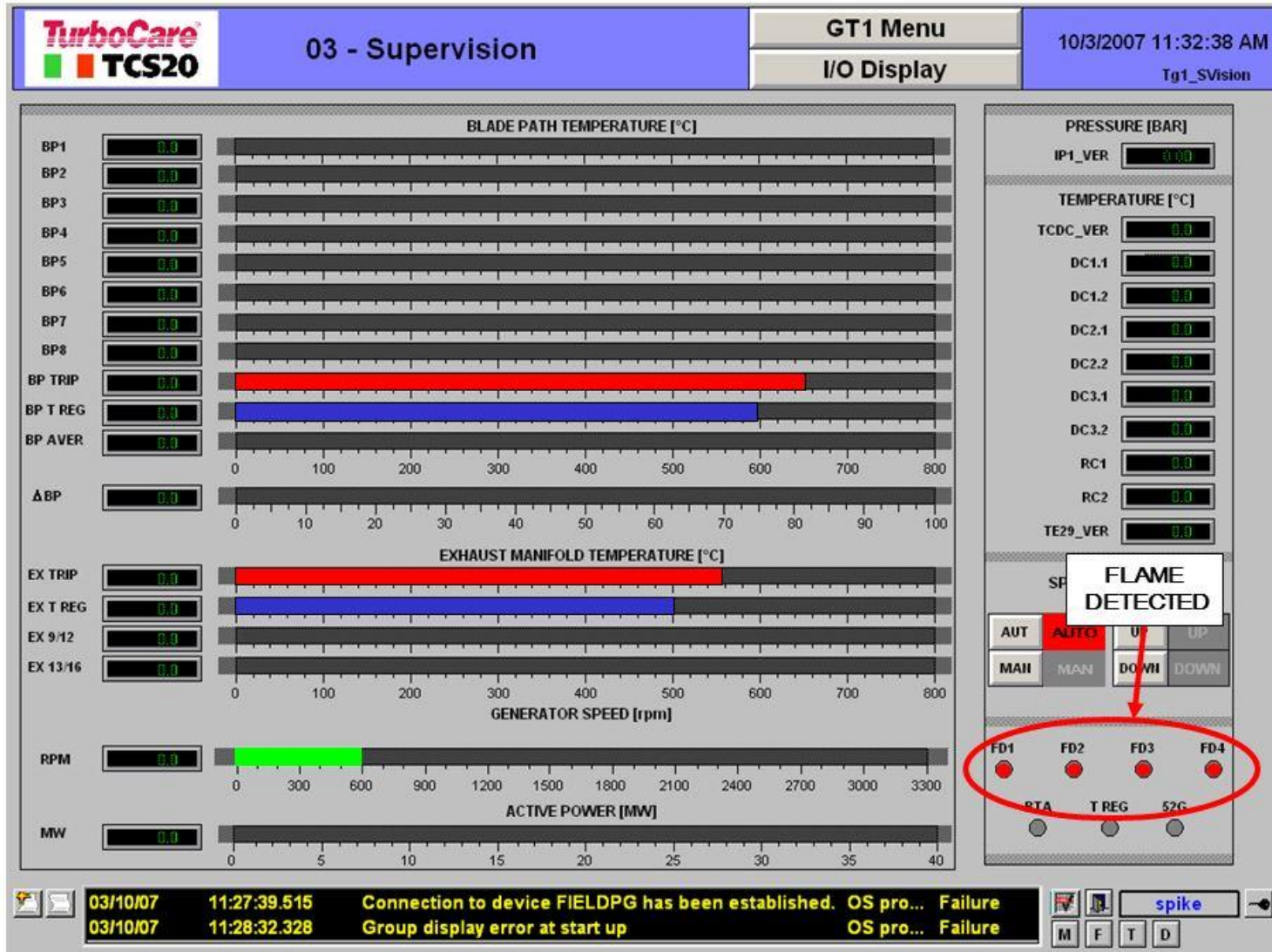
03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

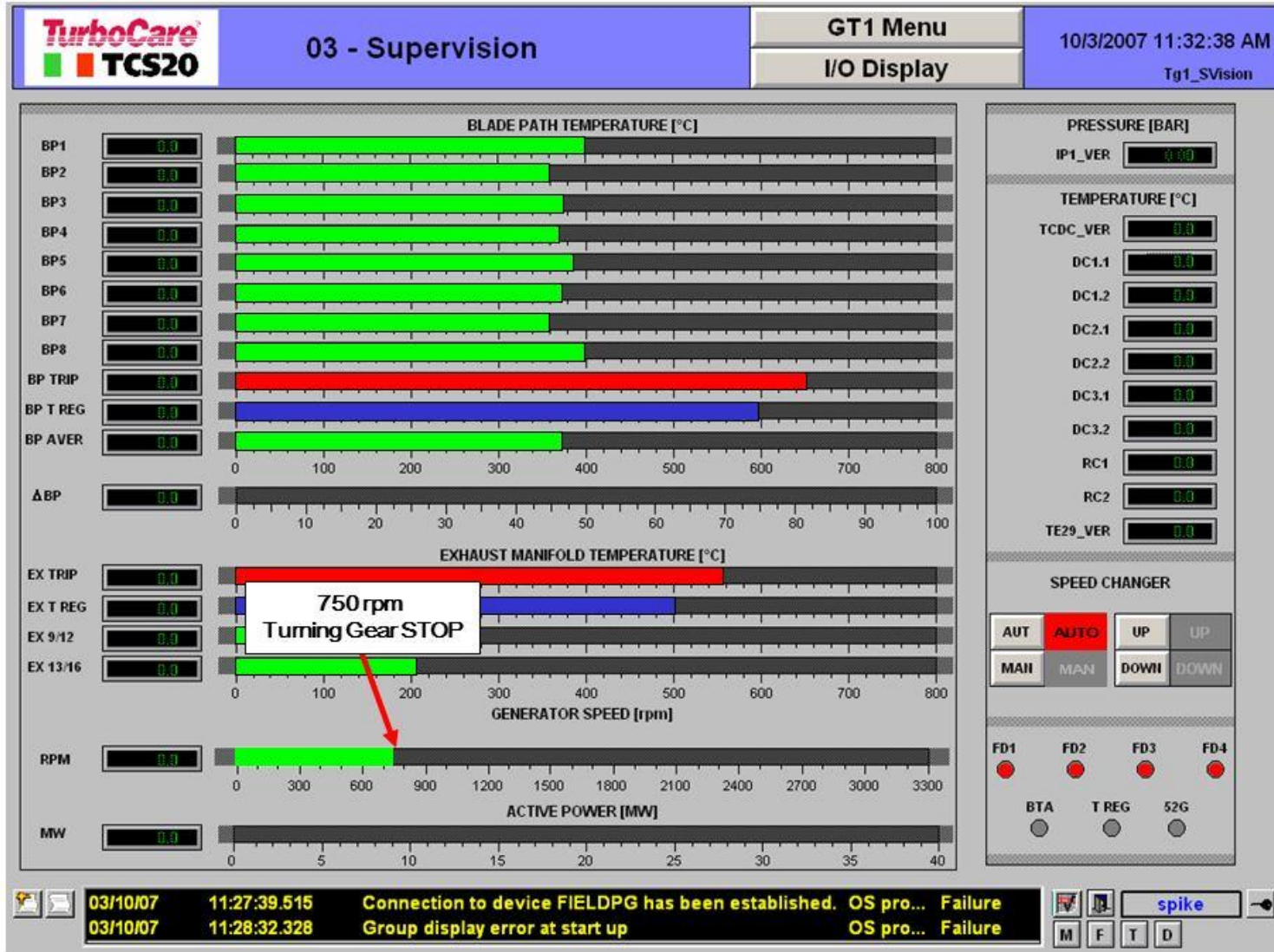
M F T D

توقف شمعات الإشعال أو القدح Spark-plugs بعد (خمس ثواني)

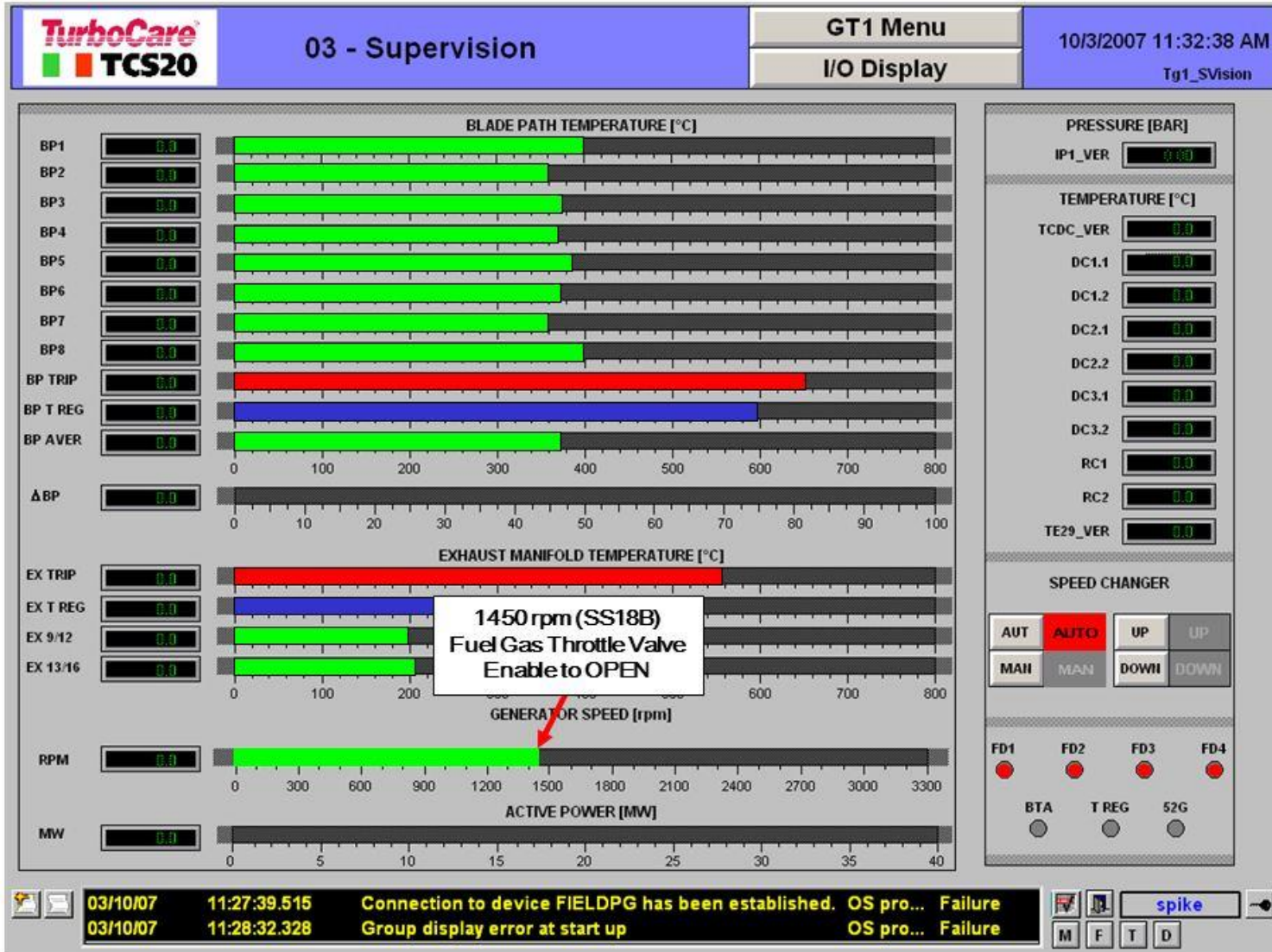


سرعة المولدة GENERATOR SPEED (٦٠٠ دورة في الدقيقة) ، كاشفات اللهب أو الشعلة بالعمل (FD1 , FD2 , FD3 , FD4) FLAME DETECTED . تحقق من زيادة درجة الحرارة على المزدوجات الحرارية لمسار الريش الحار Blade-Path thermocouples .  
(الصفحة الرئيسية للمراقبة والإشراف Supervision)



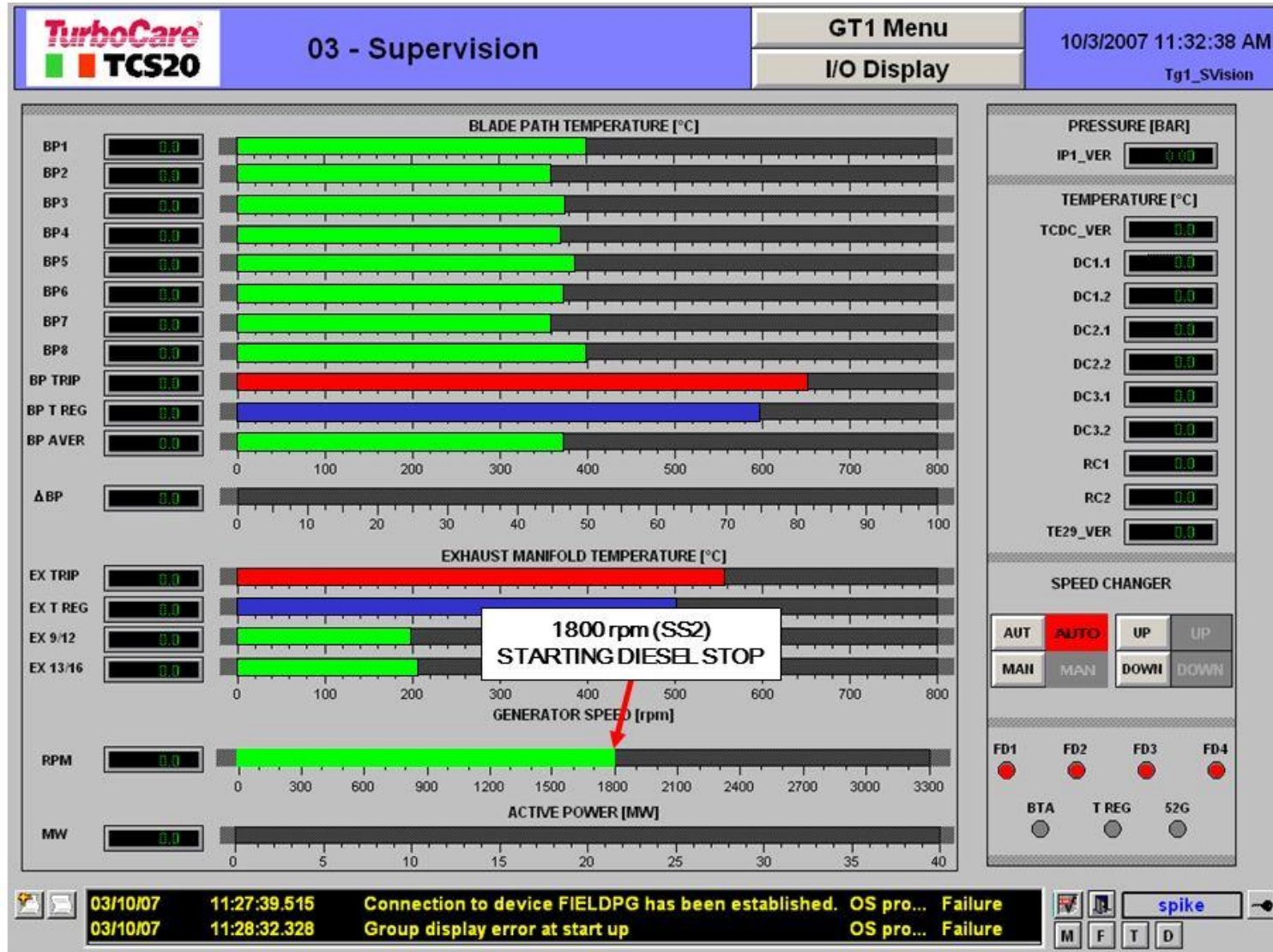


السرعة المرجعية للمولدة GENERATOR SPEED ( ٧٥٠ دورة في الدقيقة ) ، توقف جهاز أو مسنن التدوير البطيء Turning Gear STOP

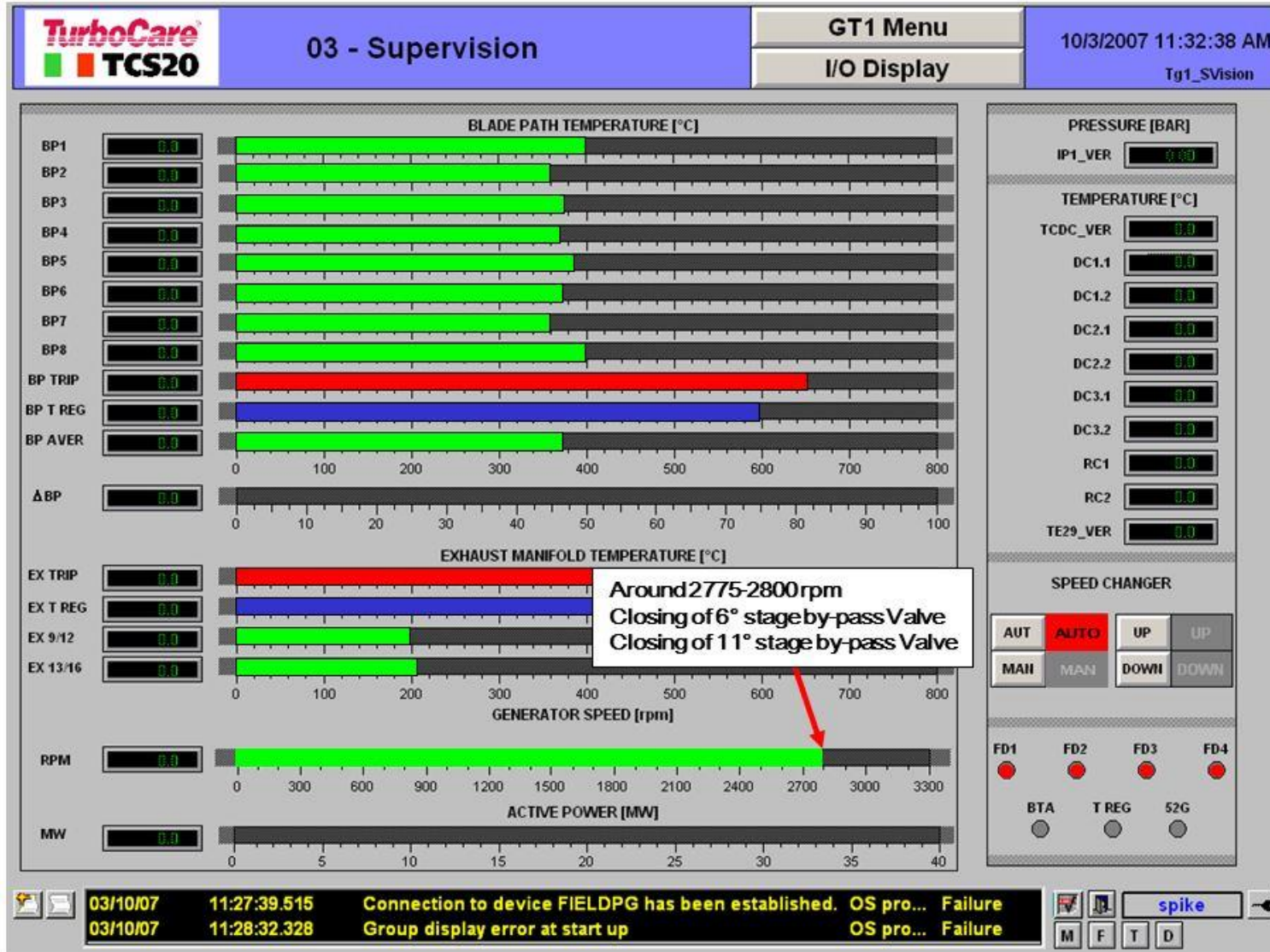


السرعة المرجعية ( ١٤٥٠ دورة في الدقيقة ) ، صمام خنق وقود الغاز (FGV3) Fuel Gas Throttle Valve متاح للفتح



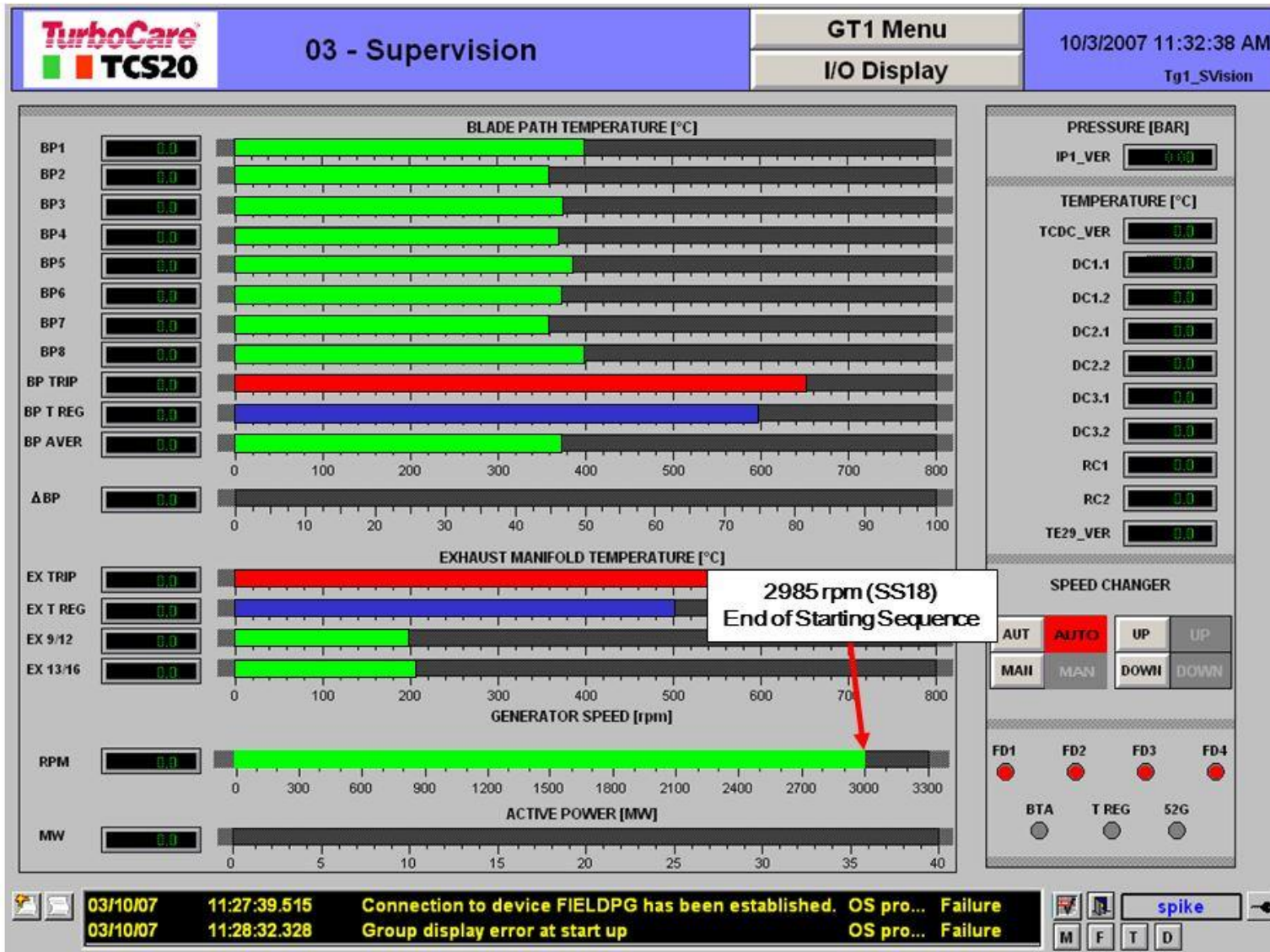


السرعة المرجعية ( ١٨٠٠ دورة في الدقيقة ) ، بدء إيقاف ديزل بدء التشغيل STARTING DIESEL STOP والتشغيل في حالة التبريد ( ٣٠٠ دورة في الدقيقة ) لمدة ( ٣ دقائق )



سرعة المولدة حوالي (٢٧٧٥-٢٨٠٠ دورة في الدقيقة) ، إغلاق صمام الإلتفاف للمرحلة السادسة (VBP6) 6° stage by-pass valve ، وصمام الإلتفاف للمرحلة الحادية عشر (VBP11) 11° stage by-pass valve





السرعة المرجعية ( ٢٩٨٥ دورة في الدقيقة ) ، نهاية تسلسل خطوات بدء التشغيل End of Starting Sequence ، مغير السرعة Speed changer تحت سيطرة جهاز التزامن Synchronizer ، المحثة Exciter في وضع ON

بدء تشغيل وقود الغاز (نهاية تسلسل الإجراءات) : FUEL GAS START UP (End of Sequence)

The screenshot displays the '02 - Starting Sequence' screen of the TurboCare TCS20 control system. The interface is organized into several sections:

- Top Bar:** Contains the TurboCare logo, the title '02 - Starting Sequence', 'GT1 Menu', 'I/O Display', and the timestamp '10/3/2007 11:31:23 AM' with 'Tg1\_StartSeq' below it.
- Status Indicators:** A grid of colored boxes (green, yellow, red) representing various system statuses such as 'TCS SELECTORS IN AUTO', 'M.C.C. CONSENT', 'STARTING DIESEL CONSENT', 'COMBUSTIBLE CONSENT', 'BY-PASS VALVES OPEN', 'TURNING GEAR MOTOR RUNNING' (circled in red), 'SSC CLUTCH ENGAGED', 'LUBR. OIL TEMP. CONSENT', 'P57', 'PROTECTION CONSENT', 'STARTING CONSENT', 'STARTING DIESEL IN OPERATION', 'P56', 'P57B', 'SPURK-PLUGS COMM', 'YV1', 'FD1', 'FD2', 'FD3', 'FD4', 'BY-PASS VALVES CLOSED', and 'STARTING END'.
- Control Panels:** Multiple panels for 'SPEED CHANGER', 'VALVE', 'FUEL CHARGE-OVER', 'AUXILIARY OIL PUMP', 'GAS VEITE VALVE', 'EMERGENCY OIL PUMP', 'AUXILIARY OIL PUMP', 'OVERSPEED VALVE', 'FUEL SELECTION', 'TEST', 'SPEED DROOP CONTROL', 'POWER CONTROL', 'STARTING TURBINE', and 'STOP TURBINE'. Each panel contains buttons for 'AUTO', 'MAN', 'ON', 'OFF', 'UP', 'DOWN', 'GAS', 'CHANGE', 'FUEL OIL', 'STARTING TEST', 'OVERSPEED TEST', 'SPEED DROOP TEST', 'SIMULATION TEST', 'TURBINE RUNNING', 'START', and 'STOP'.
- Display and Monitoring:** A central display shows '750 rpm Turning Gear STOP'. A 'TDPU' (Turbine Drive Protection Unit) section shows '180 sec.'. A 'GENERATOR SPEED' section shows '0 rpm', 'ACTIVE POWER' shows '0 MW', and 'EXHAUST TEMPERATURE' shows '0 °C'.
- Status Bar:** At the bottom, it shows system messages: '03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure' and '03/10/07 11:28:32.328 Group display error at start up OS pro... Failure'. There is also a 'spike' button and 'M F T D' indicators.

توقف جهاز أو مسنن التدوير البطيء Turning Gear STOP عند السرعة (٧٥٠ دورة في الدقيقة)



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	P57	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	P56	P57B	SPURK-PLUGS COMMAND	XV1	F03	F02	F03	F04	BY-PASS VALVES CLOSED	STARTING END

### 1800 rpm STARTING DIESEL STOP

**EMERGENCY OIL PUMP**

ON OFF

**AUXILIARY OIL PUMP**

ON OFF

**OVERSPEED VALVE**

ON OFF

**FUEL SELECTION**

GAS CHANGE FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

**SPEED DROOP CONTROL**

POWER CONTROL

**STARTING TURBINE**

TURBINE RUNNING

START

**STOP TURBINE**

STOP

TDPU 180 sec.

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C


03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

توقف محرك ديزل بدء التشغيل STARTING DIESEL STOP عند السرعة (١٨٠٠ دورة في الدقيقة)



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	P57	PROTECTION	STARTING CONSENT
STARTING DIESEL III OPERATION	P56	P57B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

**FUEL CHANGE-OVER**

AUT	AUTO
MAN	MAN

2775-2800 rpm  
BY-PASS VALVES  
CLOSED

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL
---------------------

**POWER CONTROL**

POWER CONTROL
---------------

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**TDPU**

180 sec.
----------

GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

03/10/07 11:27:39.515	Connection to device FIELDPG has been established. OS pro... Failure
03/10/07 11:28:32.328	Group display error at start up OS pro... Failure

spike

M	F	T	D
---	---	---	---

غلق الصمامات الإلتفافية أو التحويلية BY-PASS VALVES CLOSED عند السرعة (2775-2800 دورة في الدقيقة)

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL III OPEARATION	P56	P57B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT	AUTO
MAN	MAN

**SPEED CHANGER**

UP	UP
DOWN	DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT	AUTO
MAN	MAN

2985 rpm (SS18)  
 END OF STARTING SEQUENCE

**EMERGENCY OIL PUMP**

ON	OFF
----	-----

**AUXILIARY OIL PUMP**

ON	OFF
----	-----

**OVERSPEED VALVE**

ON	OFF
----	-----

**FUEL SELECTION**

GAS	CHANGE	FUEL OIL
-----	--------	----------

**TEST**

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

**SPEED DROOP CONTROL**

SPEED DROOP CONTROL
---------------------

**POWER CONTROL**

POWER CONTROL
---------------

**STARTING TURBINE**

TURBINE RUNNING
START

**STOP TURBINE**

STOP
------

**TDPU**

0 sec
-------


GENERATOR SPEED	0 rpm
ACTIVE POWER	0 MW
EXHAUST TEMPERATURE	0 °C

03/10/07	11:27:39.515	Connection to device FIELDPG has been established. OS pro...	Failure
03/10/07	11:28:32.328	Group display error at start up	OS pro... Failure

نهاية تسلسل خطوات بدء التشغيل END OF STARTING SEQUENCE عند السرعة ( 2985 دورة في الدقيقة )

بدء تشغيل زيت الوقود : FUEL OIL START UP



## 02 - Starting Sequence

GT1 Menu  
I/O Display

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSC CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL BI OPEARATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDENSATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	OFF
MAN	MAN

GAS VEITE VALVE

AUT	ON
OFF	OFF
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION:

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

TDPU

100 sec.

STARTING TURBINE

START

STOP TURBINE

STOP

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure
spike

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

الصفحة الرئيسية لتسلسل إجراءات بدء التشغيل Starting Sequence

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**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SEC. CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT **AUTO** MAN  
 UP UP DOWN DOWN

**DRAINING GAS CONDEISATE VALVE**  
 AUT **AUTO** MAN

**FUEL CHANGE-OVER**  
 AUT **AUTO** MAN

**AUXILIARY OIL PUMP**  
 AUT **AUTO** OFF MAN

**GAS VEITE VALVE**  
 AUT ON OFF **OFF** MAN

**EMERGEICY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE **FUEL OIL**

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 START STOP

**TDPU**  
 180 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

التحقق من اختيار الوقود الصحيح ( وهنا زيت الوقود FUEL OIL )

**TurboCare**  
**TCS20**

**02 - Starting Sequence**

**GT1 Menu**  
**I/O Display**

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	RS2	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PSG	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
AUT **AUTO**  
MAN **MAN**

**SPEED CHANGER**  
UP UP  
DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
AUT **AUTO**  
MAN **MAN**

**FUEL CHANGE-OVER**  
AUT **AUTO**  
MAN **MAN**

**AUXILIARY OIL PUMP**  
AUT **AUTO**  
OFF OFF  
MAN **MAN**

**GAS VEINTE VALVE**  
AUT ON  
OFF OFF  
MAN **OFF**

**EMERGENCY OIL PUMP**  
ON OFF

**AUXILIARY OIL PUMP**  
**ON** OFF

**OVERSPEED VALVE**  
ON OFF

**FUEL SELECTION**  
GAS CHANGE **FUEL OIL**

**TEST**  
STARTING TEST  
OVERSPEED TEST  
SPEED DROOP TEST  
SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
START

**STOP TURBINE**  
STOP

**TDPU**  
180 sec.

**GENERATOR SPEED**  
0 rpm

**ACTIVE POWER**  
0 MW

**EXHAUST TEMPERATURE**  
0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

M F T D spike

بدء تشغيل التوربين في حالة التوليد Turbine Start Up in Generation ، حدد الزر أبدأ (START)

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS2	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS4	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHARGER**  
 AUT **AUTO**  
 MAN **MAN**

**SPEED CHARGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSAT VALVE**  
 AUT **AUTO**  
 MAN **MAN**

**AUXILIARY OIL PUMP**  
 AUT **AUTO**  
 OFF OFF  
 MAN **MAN**

**GAS VEITE VALVE**  
 AUT ON  
 OFF OFF  
 MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE **FUEL OIL**

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 START

**STOP TURBINE**  
 STOP

**TOPU**  
 180 sec.

**GENERATOR SPEED** 3 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 4 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

اضغط على موافق (OK) في نافذة التأكيد Confirmation window لتنفيذ الأمر

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

YES SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	RSO	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**MASTER TG ENERGIZED**

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**VALVE**  
 AUT AUTO  
 MAN MAN

**FUEL CHANGE-OVER**  
 AUT AUTO  
 MAN MAN

**AUXILIARY OIL PUMP**  
 AUT AUTO  
 OFF OFF  
 MAN MAN

**GAS VALVE**  
 AUT ON  
 OFF OFF  
 MAN OFF

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 180 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

الآن يتم تفعيل أو تنشيط المرحل الكهربائي الرئيسي MASTER TG relay ENERGIZED



## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSC CLUTCH ENGAGED	LUBE OIL TEMP. CONSENT	PCV	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT AUTO

MAN MAN

**SPEED CHANGER**

UP UP

DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT AUTO

MAN MAN

**FUEL CHANGE-OVER**

AUT AUTO

MAN MAN

**AUXILIARY OIL PUMP**

AUT AUTO

OFF OFF

MAN MAN

**GAS VEINTE VALVE**

AUT ON

OFF OFF

MAN OFF

**EMERGENCY OIL PUMP**

ON OFF

**AUXILIARY OIL PUMP**

ON OFF

**OVERSPEED VALVE**

ON OFF

**FUEL SELECTION**

GAS CHANGE FUEL OIL

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

SPEED DROOP CONTROL      POWER CONTROL

**STARTING TURBINE**

TURBINE STARTING

START

**STOP TURBINE**

STOP

TDPU: 180 sec.

GENERATOR SPEED: 0 rpm

ACTIVE POWER: 0 MW

EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

التسخين المسبق لديزل بدء التشغيل STARTING DIESEL IN OPERATION

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM** **Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	DOG CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING MANUAL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT **AUTO**  
 MAN **MAN**

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT **AUTO**  
 MAN **MAN**

**FUEL CHANGE-OVER**  
 AUT **AUTO**  
 MAN **MAN**

**AUXILIARY OIL PUMP**  
 AUT **AUTO**  
 OFF OFF  
 MAN **MAN**

**GAS VEITE VALVE**  
 AUT ON  
 OFF OFF  
 MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE **FUEL OIL**

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**COUNT DOWN PURGING TIME**  
 TOPU  
**180 sec**

**SPEED UNDOOP CONTROL**  
 POWER CONTROL

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**GENERATOR SPEED** 1 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

وقت العد التنازلي للتطهير أو التنظيف بدء عملية التطهير purging بأدنى سرعة (٣٠٠ دورة في الدقيقة) ولمدة (١٨٠ ثانية)

بدء تشغيل زيت الوقود (تابع) : FUEL OIL START UP (continue)

**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | 10/3/2007 11:31:23 AM  
**I/O Display** | Tg1\_StartSeq

PCS SELECTOR IN AUTO	M.C.C. CONSENT	STARTING SEQUENCE CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	FURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBE OIL TEMP. CONSENT	PGT	PROTECTION CONSENT	STARTING CONSENT
STARTING SEQUENCE IN OPERATION	P56	P57B	SPURK-PLUGS-COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**: AUT **AUTO** MAN **MAN**  
**SPEED CHANGER**: UP UP DOWN DOWN  
**DRAINING GAS CONDENSATE VALVE**: AUT **AUTO** MAN **MAN**  
**FUEL CHANGE-OVER**: AUT **AUTO** MAN **MAN**  
**AUXILIARY OIL PUMP**: AUT **AUTO** OFF OFF MAN **MAN**  
**GAS VEITE VALVE**: AUT ON OFF OFF MAN **OFF**

**EMERGENCY OIL PUMP**: ON OFF  
**AUXILIARY OIL PUMP**: ON OFF  
**OVERSPEED VALVE**: ON OFF  
**FUEL SELECTION**: GAS CHANGE **FUEL OIL**  
**TEST**: **300 rpm** SIMULATION TEST


**TDCU**: **0 sec**

**SPEED DROOP CONTROL**: **STARTING TURBINE** (UPRDS BURNING) START STOP TURBINE STOP

**GENERATOR SPEED**: 0 rpm  
**ACTIVE POWER**: 0 MW  
**EXHAUST TEMPERATURE**: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

السرعة المرجعية للمولدة ( 300 دورة في الدقيقة rpm ) GENERATOR SPEED



## 02 - Starting Sequence

GT1 Menu  
I/O Display

10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OVER CON	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**

AUT **AUTO**

MAN MAN

**SPEED CHANGER**

UP UP

DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**

AUT **AUTO**

MAN MAN

**FUEL CHANGE-OVER**

AUT **AUTO**

MAN MAN

**AUXILIARY OIL PUMP**

AUT **AUTO**

OFF OFF

**GAS VENT VALVE**

AUT ON

OFF OFF

MAN **OFF**

### STARTING DIESEL ACCELERATION

**EMERGENCY OIL PUMP**

ON OFF

**AUXILIARY OIL PUMP**

ON OFF

**OVERSPEED VALVE**

ON OFF

**FUEL SELECTION**

GAS CHANGE **FUEL OIL**

**TEST**

STARTING TEST

OVERSPEED TEST

SPEED DROOP TEST

SIMULATION TEST

SPEED DROOP CONTROL

POWER CONTROL

**TDPU**

0 sec.

**STARTING TURBINE**

STARTING RUNNING

START

**STOP TURBINE**

STOP

**GENERATOR SPEED** 0 rpm

**ACTIVE POWER** 0 MW

**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

بدء تسارع الديزل STARTING DIESEL ACCELERATION حتى بداية الإكتفاء الذاتي Self-sustaining (أي الحد الأدنى لسرعة عمود الضاغط الذي يتم عنده إستمرارية عمل ( تدوير ) التوربين بلا حمل وبدون قوة تحريك وهنا تساوي 1800 دورة في الدقيقة)



**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DROOP CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSR CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING SIGNAL BY OPERATOR	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**GT SPEED INCREASE UNTIL THERE IS THE CORRECT VALUE OF AIR COMPRESSOR DELIVERY PRESSURE FOR THE IGNITION**

SPEED CHANGER: AUT, MAN  
 SPEED CHANGER: UP, DOWN  
 DRAINING GAS CONDENSATE VALVE: ALIT, OPEN, CLOSE  
 FUEL CHANGE-OVER: ALIT, GAS, CHANGE, FUEL OIL  
 AUXILIARY OIL PUMP: ALIT, ON, OFF  
 GAS VEITE VALVE: ALIT, OPEN, CLOSE

EMERGENCY OIL PUMP: ON, OFF  
 AUXILIARY OIL PUMP: ON, OFF  
 OVERSPEED VALVE: ON, OFF  
 FUEL SELECTION: GAS, CHANGE, FUEL OIL  
 TEST: STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST

SPEED DROOP CONTROL: ON, OFF  
 POWER CONTROL: ON, OFF

STARTING TURBINE: TURBINE RUNNING, START  
 STOP TURBINE: STOP

TDPV: 0 sec

GENERATOR SPEED: 0 rpm  
 ACTIVE POWER: 0 MW  
 EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

M F T D spike

تزداد سرعة التوربين الغازي GT لغاية تأمين القيمة الصحيحة لضغط هواء الضاغطة اللازم لبدء الأشتعال

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TG SELECTIONS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SG CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN GENERATOR	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT **AUTO**  
 MAN **MAN**

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT **AUTO**  
 MAN **MAN**

**FUEL CHANGE-OVER**  
 AUT **AUTO**  
 MAN **MAN**

**AUXILIARY OIL PUMP**  
 AUT **AUTO**  
 OFF OFF  
 MAN **MAN**

**GAS VENT VALVE**  
 AUT ON  
 OFF OFF  
 MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE **FUEL OIL**

**TEST**  
**600 rpm**  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**  
 0 sec

**STARTING TURBINE**  
**TURBINE BURNING**  
 START

**STOP TURBINE**  
 STOP

**GENERATOR SPEED** 3 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

السرعة المرجعية للمولدة (600 دورة في الدقيقة) GENERATOR SPEED

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	DEE CLUTCH ENGAGED	LUBE OIL TEMP CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL OPERATORS	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EBD

SPEED CHANGER: AUT AUTO, MAN MAN, UP UP, DOWN DOWN

DRAINING GAS CONDENSATE VALVE: AUT AUTO, MAN MAN

FUEL CHANGE-OVER: AUT AUTO, MAN MAN

AUXILIARY OIL PUMP: AUT AUTO, OFF OFF, MAN MAN

GAS VEINTE VALVE: AUT ON, OFF OFF, MAN OFF

EMERGENCY OIL PUMP: ON OFF

AUXILIARY OIL PUMP: ON OFF

OVERSPEED VALVE: ON OFF

FUEL SELECTION: GAS CHANGE FUEL OIL

TEST: STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST

SPEED DROOP CONTROL: SPEED DROOP CONTROL

POWER CONTROL: POWER CONTROL

TDPU: TDPU

STARTING TURBINE: TURBINE RUNNING, START

STOP TURBINE: STOP

GENERATOR SPEED: 0 rpm

ACTIVE POWER: 0 MW

EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

مفتاح الضغط على الضغط المنجز لضاغطة الهواء في وضع (PS6) ON ، الإعداد أو الضبط عند xx ملي بار (mbar)

**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | **10/3/2007 11:31:23 AM**  
**I/O Display** | **Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING SEQUEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVE OPEN	TURBINE GEAR MOTOR WARMING	SSG CLUTCH ENGAGED	LOW OIL TEMP. CONSENT	PG2	PROTECTION CONSENT	STARTING CONSENT
STARTING SEQUEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**SPEED CHANGER**  
 AUT **AUTO** | MAN **MAN**  
 UP **UP** | DOWN **DOWN**

**DRAINING GAS CONDENSATE VALVE**  
 AUT **AUTO** | MAN **MAN**

**FUEL CHANGE-OVER**  
 AJT **AUTO** | MAN **MAN**

**AUXILIARY OIL PUMP**  
 AJT **AUTO** | OFF **OFF** | MAN **MAN**

**GAS VENTIL VALVE**  
 AJT **ON** | OFF **OFF** | MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON **OFF**

**AUXILIARY OIL PUMP**  
 ON **ON** | OFF **OFF**

**OVERSPEED VALVE**  
 ON **OFF**

**FUEL SELECTION**  
 GAS | CHANGE | **FUEL OIL**

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**  
 POWER CONTROL

**STARTING TURBINE**  
 TURBINE RUNNING | START

**STOP TURBINE**  
 STOP

**TDPU**  
 0 sec

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike | M F T D

مفتاح الضغط على دورة الهواء عند السرعة الزائدة (تجاوز السرعة Overspeed) في وضع (PS7B) ON ، الإعداد أو الضبط عند xx ملي بار (mbar)



**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING SPEED CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	DIS-CLUTCH ENGAGED	LUBL. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING SIGNAL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTBIG END

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT AUTO  
 MAN MAN

**FUEL CHANGE-OVER**  
 AUT AUTO  
 MAN MAN

**AUXILIARY OIL PUMP**  
 AUT AUTO  
 OFF OFF  
 MAN MAN

**GAS VENT VALVE**  
 AUT ON  
 OFF OFF  
 MAN OFF

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 0 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

صمام السرعة الزائدة OVERSPEED VALVE في وضع ON

## 02 - Starting Sequence

GT1 Menu

I/O Display

10/3/2007 11:31:23 AM

Tg1\_StartSeq

TCS SELECTORS IN AUTO	REC.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURNING GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN SPEED TEST	PS6	PS7B	SPARK-PLUGS COMMAND	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTBIG END

SPEED CHANGER

AUT	AUTO
MAN	MAN

SPEED CHANGER

UP	UP
DOWN	DOWN

DRAWING GAS CONDEISATE VALVE

AUT	AUTO
MAN	MAN

FUEL CHANGE-OVER

AUT	AUTO
MAN	MAN

AUXILIARY OIL PUMP

AUT	AUTO
OFF	OFF
MAN	MAN

GAS VENTE VALVE

AUT	ON
OFF	OFF
MAN	OFF

EMERGENCY OIL PUMP

ON	OFF
----	-----

AUXILIARY OIL PUMP

ON	OFF
----	-----

OVERSPEED VALVE

ON	OFF
----	-----

FUEL SELECTION

GAS	CHANGE	FUEL OIL
-----	--------	----------

TEST

STARTING TEST
OVERSPEED TEST
SPEED DROOP TEST
SIMULATION TEST

SPEED DROOP CONTROL

SPEED DROOP CONTROL

POWER CONTROL

POWER CONTROL

STARTING TURBINE

TURBINE RUNNING
START

STOP TURBINE

STOP

TDPU

0.000

GENERATOR SPEED 0 rpm

ACTIVE POWER 0 MW

EXHAUST TEMPERATURE 0 °C

03/10/07	11:27:39.515	Connection to device FIELDPS has been established. OS pro... Failure	spike
03/10/07	11:28:32.328	Group display error at start up OS pro... Failure	

بدء تشغيل شمعات الإشعال أو القدح SPARK-PLUGS COMMAND

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	M.V.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BT-PASS VALVE OPEN	TURBINE GEAR MOTOR RUNNING	SS2 CLUTCH ENGAGED	COBR. OIL TEMP. CONSENT	PS0	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPARK-PLUGS FORWARD	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**AFTER 5 sec.**

**SPEED CHANGER**  
 AUT **AUTO**  
 MAN **MAN**

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**FUEL CHANGE-OVER**  
 AUT **AUTO**  
 MAN **MAN**

**AUXILIARY OIL PUMP**  
 AUT **AUTO**  
 OFF OFF  
 MAN **MAN**

**GAS VALVE**  
 AUT ON  
 OFF OFF  
 MAN **OFF**

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE **FUEL OIL**

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**  
 0 sec

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

بدء تشغيل شمعات الإشعال Spark-plugs (تأخير ٥ ثواني) لمدة ٢٠ ثانية

**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | **10/3/2007 11:31:23 AM**  
**I/O Display** | **Tg1\_StartSeq**

TCB SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PSY	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPARK PLUGS CONDENSED	IX1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END

**MASTER IGNITION ENERGIZED**

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**TDPU**  
 0 sec.

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**GAS VENT VALVE**  
 AUT ON  
 OFF OFF  
 MAN OFF

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

تفعيل أو تنشيط الأشتعال (XV1) MASTER IGNITION ENERGIZED



**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM** **Tg1\_StartSeq**

TCS SELECTORS IN AUTO	REC.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	DSC CLUTCH ENGAGED	LUBR. OIL TEMP. CONSENT	PS7	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN PROTECTION	PS6	PS7B	STARTING DIESEL CONSENT	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING END	

SPEED CHANGER: AUT AUTO, MAN MAN; UP UP, DOWN DOWN

DRAINING GAS CONDEISATE VALVE: AUT AUTO, MAN MAN

FUEL CHANGE-OVER: AUT AUTO, MAN MAN

AUXILIARY OIL PUMP: AUT AUTO, OFF OFF, MAN MAN

GAS VENTE VALVE: AUT ON, OFF OFF, MAN OFF

EMERGENCY OIL PUMP: ON OFF

AUXILIARY OIL PUMP: ON OFF

OVERSPEED VALVE: ON OFF

FUEL SELECTION: GAS CHANGE FUEL OIL

TEST: STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST

SPEED DROOP CONTROL: SPEED DROOP CONTROL

POWER CONTROL: POWER CONTROL

STARTING TURBINE: TURBINE RUNNING, START

STOP TURBINE: STOP

TDPU: 0 sec

GENERATOR SPEED: 0 rpm

ACTIVE POWER: 0 MW

EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

تشغيل كاشفات اللهب أو الشعلة (FD1 , FD2 , FD3 , FD4) Flame detectors

**TurboCare** **TCS20** **02 - Starting Sequence** **GT1 Menu** **I/O Display** **10/3/2007 11:31:23 AM**  
**Tg1\_StartSeq**

TCS SELECTORS IN AUTO	N.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSG CLUTCH ENGAGED	LOWR. OIL TEMP. CONSENT	PS2	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATOR	PS6	PS7B	SPARK-PLUGS COMMAND	OK1	OK2	OK3	OK4	OK5	BY-PASS VALVES CLOSED	STARTING END

SPEED CHARGER: AUT AUTO, MAN MAN

SPEED CHARGER: UP UP, DOWN DOWN

DRAINING GAS CONDENSATE VALVE: AUT AUTO, MAN MAN

FUEL CHANGE-OVER: AUT AUTO, MAN MAN

AUXILIARY OIL PUMP: AUT AUTO, OFF OFF, MAN MAN

GAS VENT VALVE: AUT ON, OFF OFF, MAN OFF

EMERGENCY OIL PUMP: ON OFF

AUXILIARY OIL PUMP: ON OFF

OVERSPEED VALVE: ON OFF

FUEL SELECTION: GAS CHANGE FUEL OIL

TEST: STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST

SPEED DROOP CONTROL: SPEED DROOP CONTROL

POWER CONTROL: POWER CONTROL

STARTING TURBINE: TURBINE RUNNING, START

STOP TURBINE: STOP

TOPU: 0-sec

GENERATOR SPEED: 0 rpm

ACTIVE POWER: 0 MW

EXHAUST TEMPERATURE: 0 °C

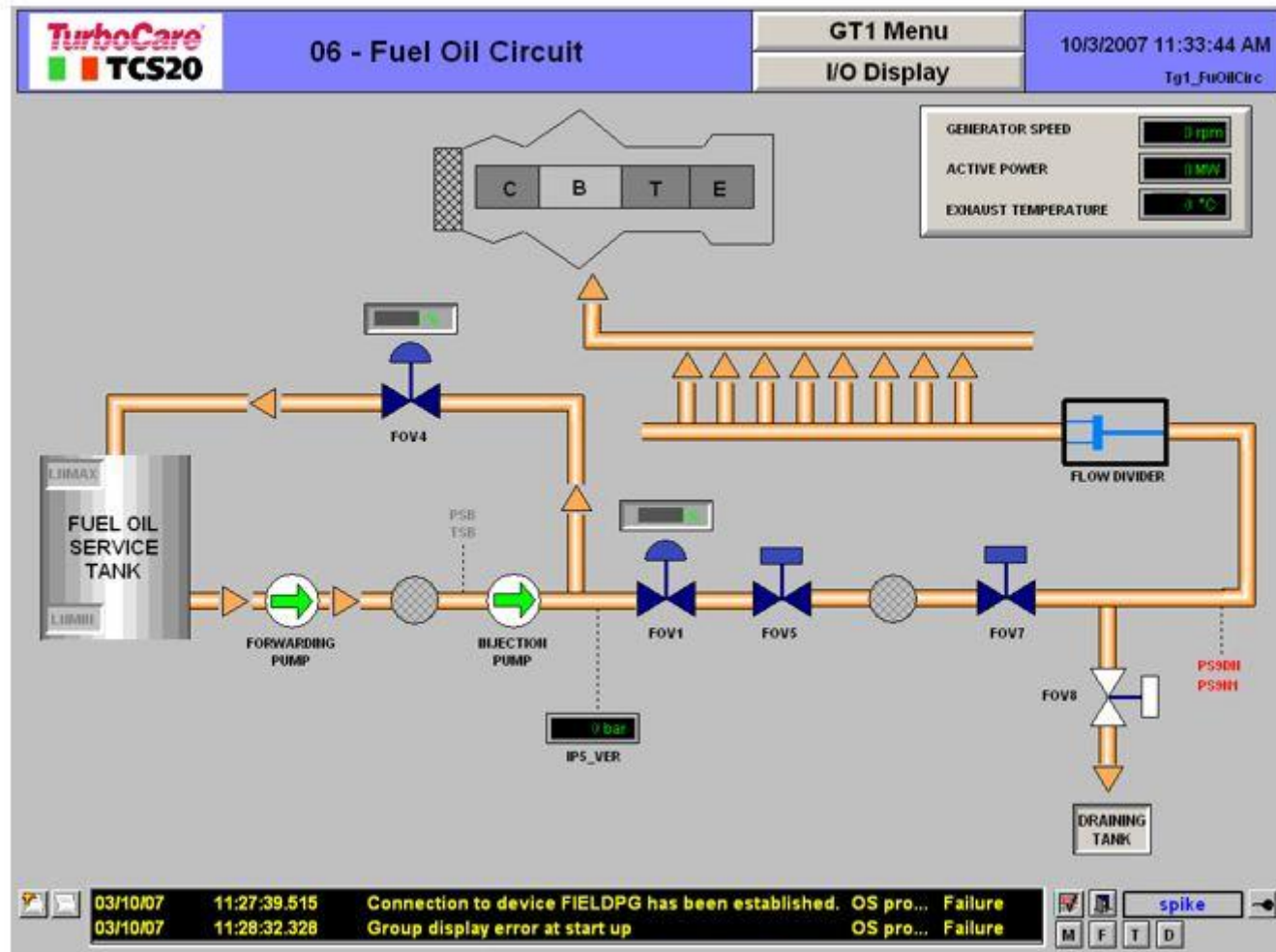
03/10/07 11:27:39.515 Connection to device FIELD PG has been established. OS pro... Failure

03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

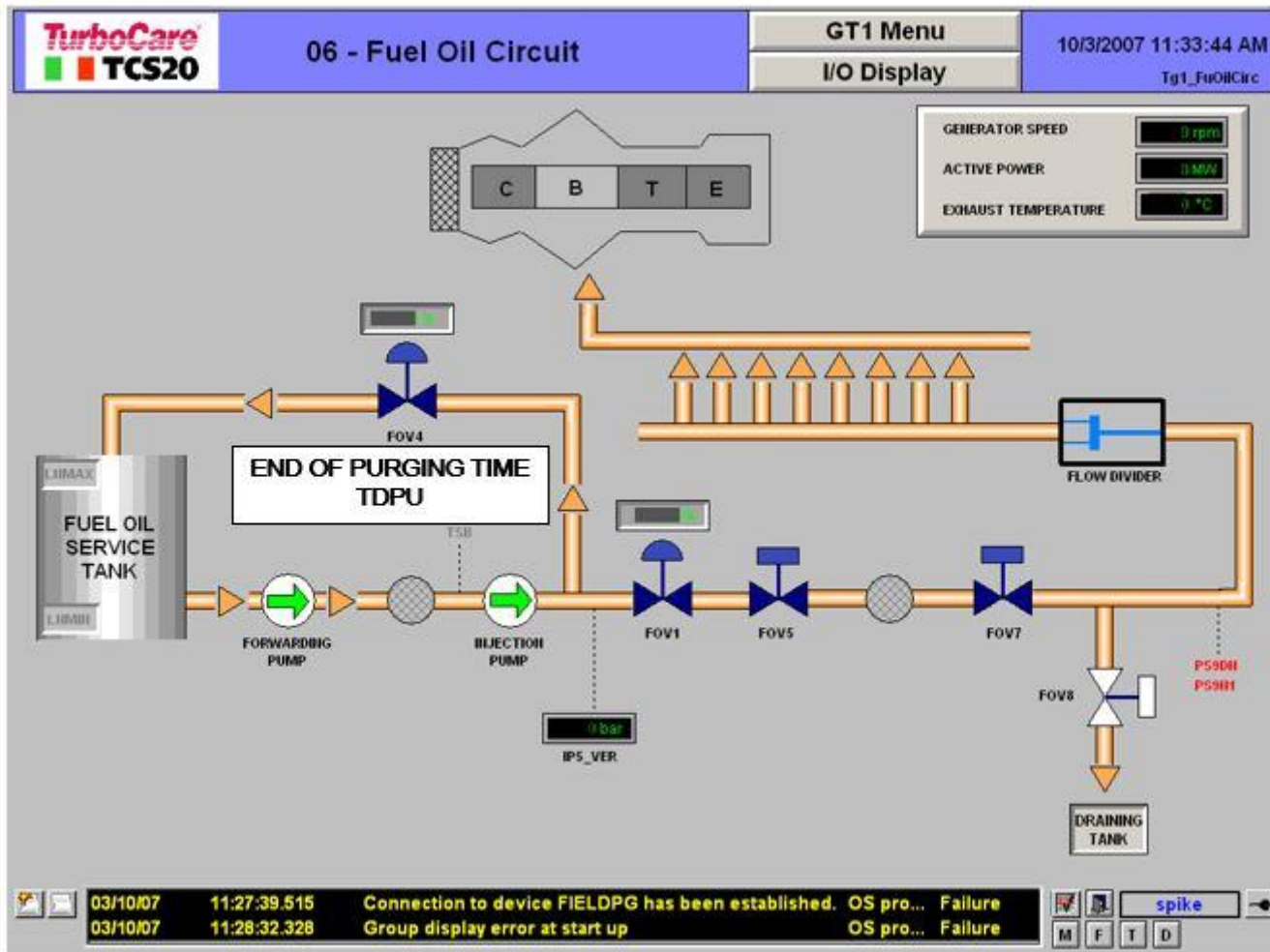
spike

M F T D

توقف شمعات الإشعال أو القدح Spark-plugs بعد (خمس ثواني)

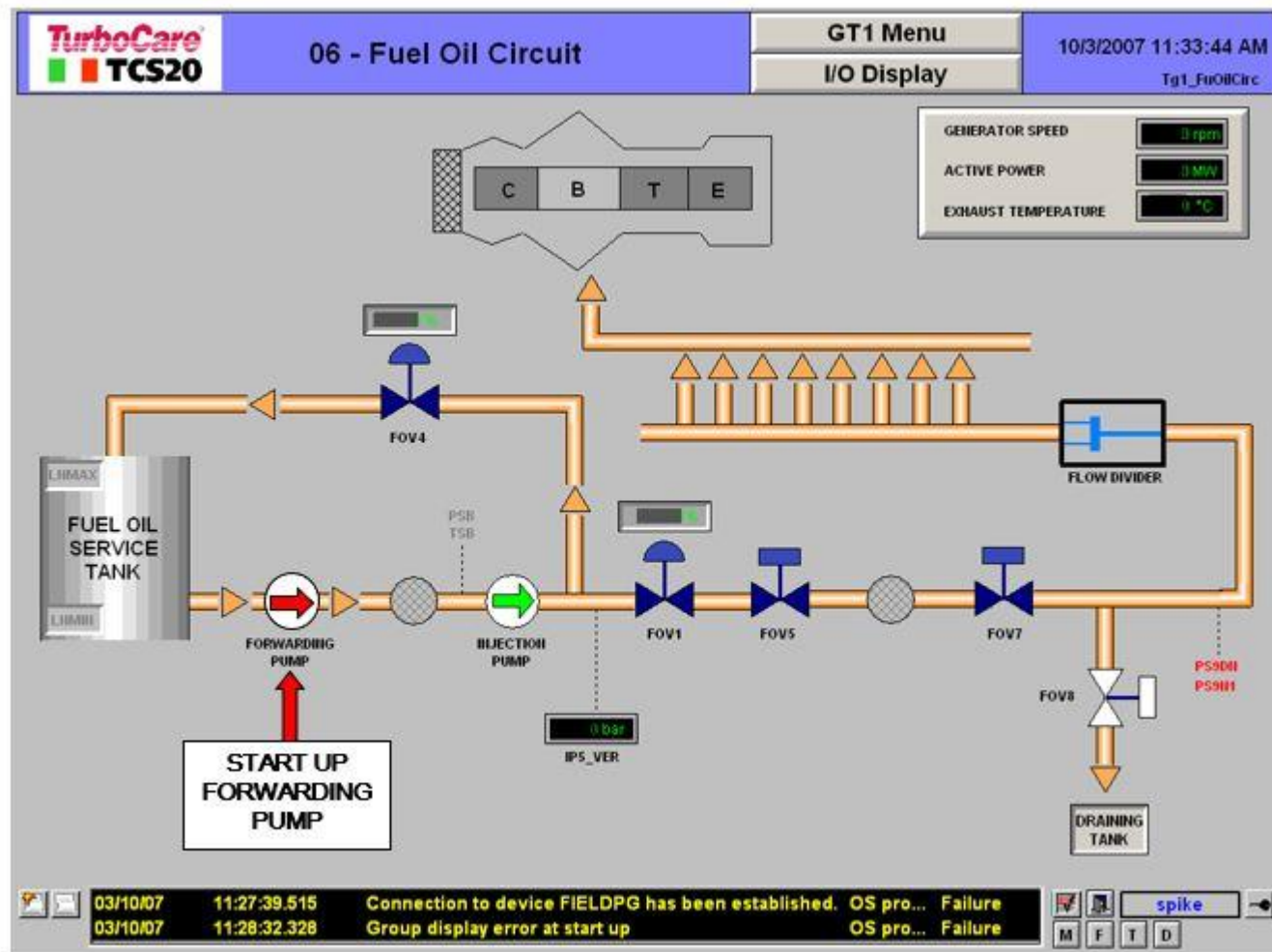


الصفحة الرئيسية لدورة زيت الوقود Fuel Oil Circuit

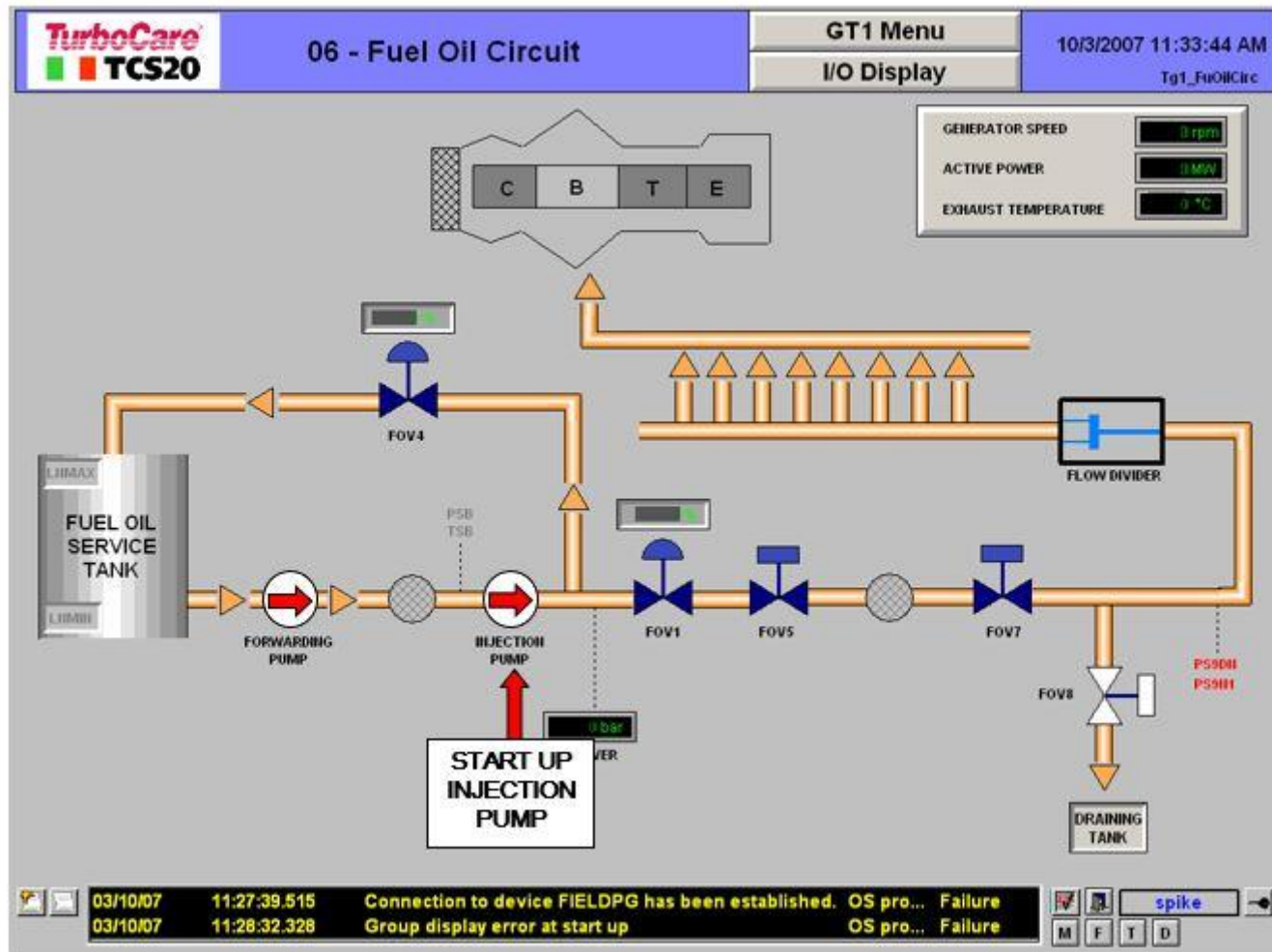


نهاية وقت التطهير END OF PURGING TIME TDPU

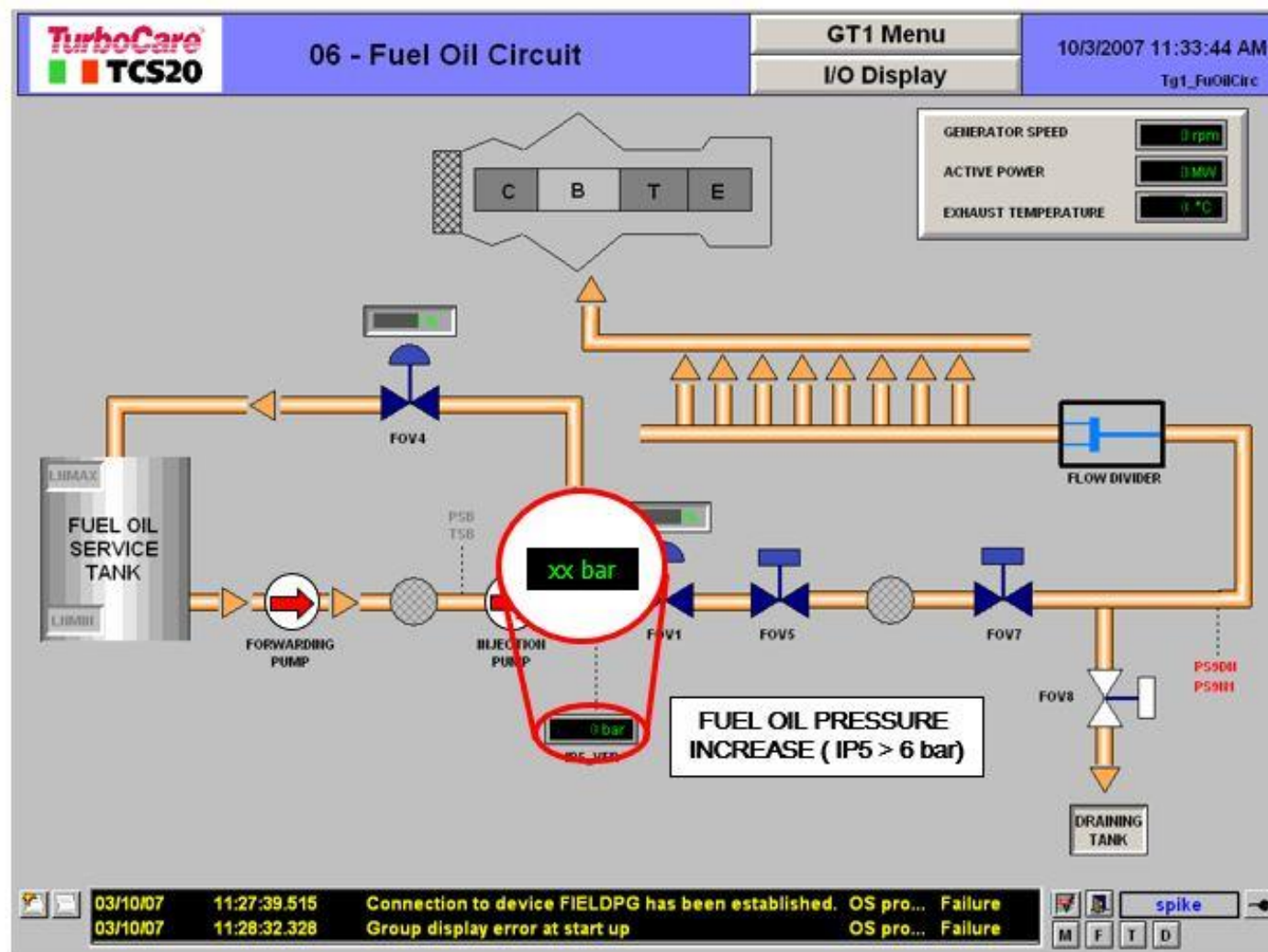




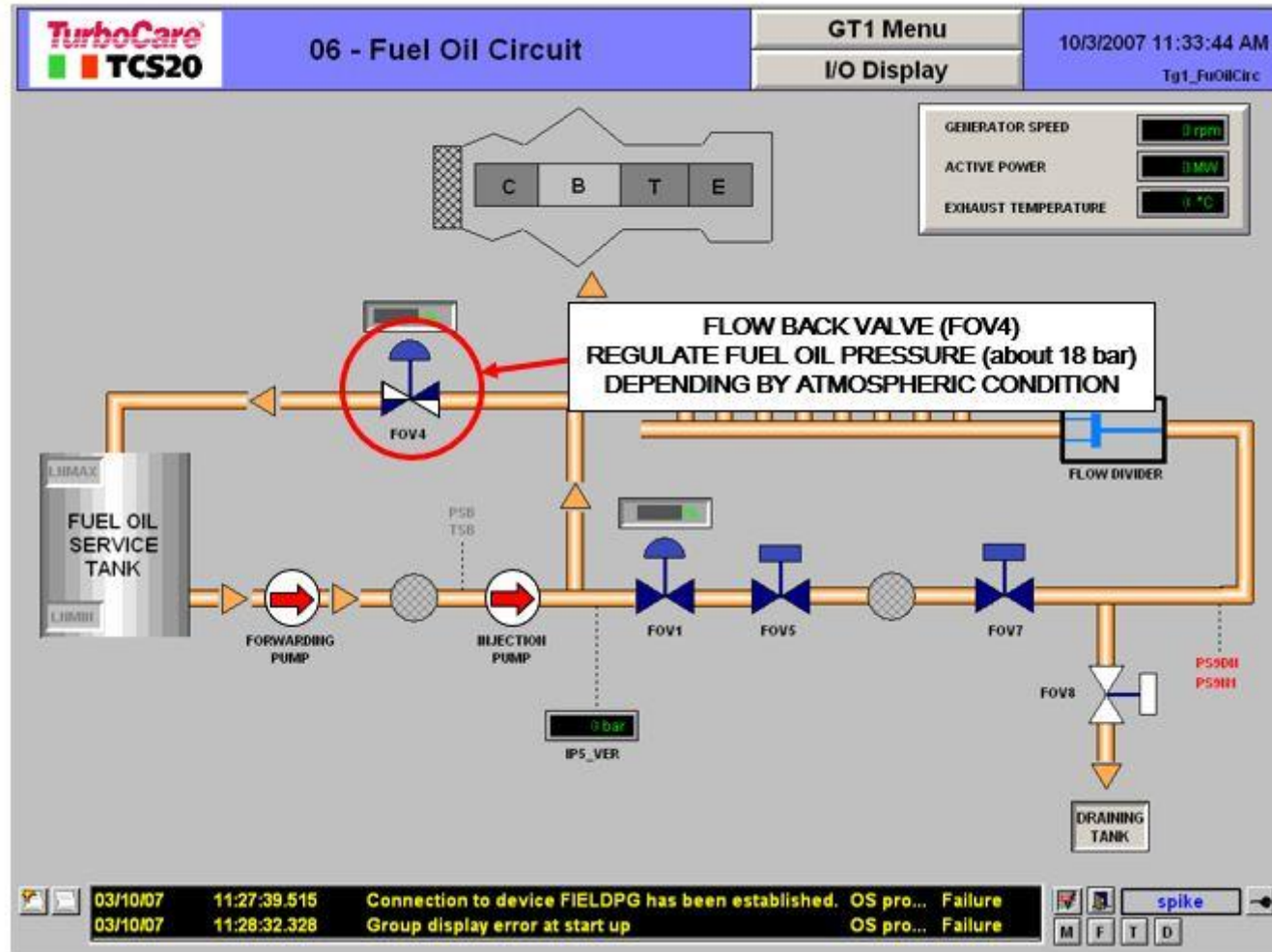
بدء تشغيل مضخة النقل (التوجيه والتعزيز) START UP FORWARDING PUMP



بدء تشغيل مضخة الحقن START UP INJECTION PUMP



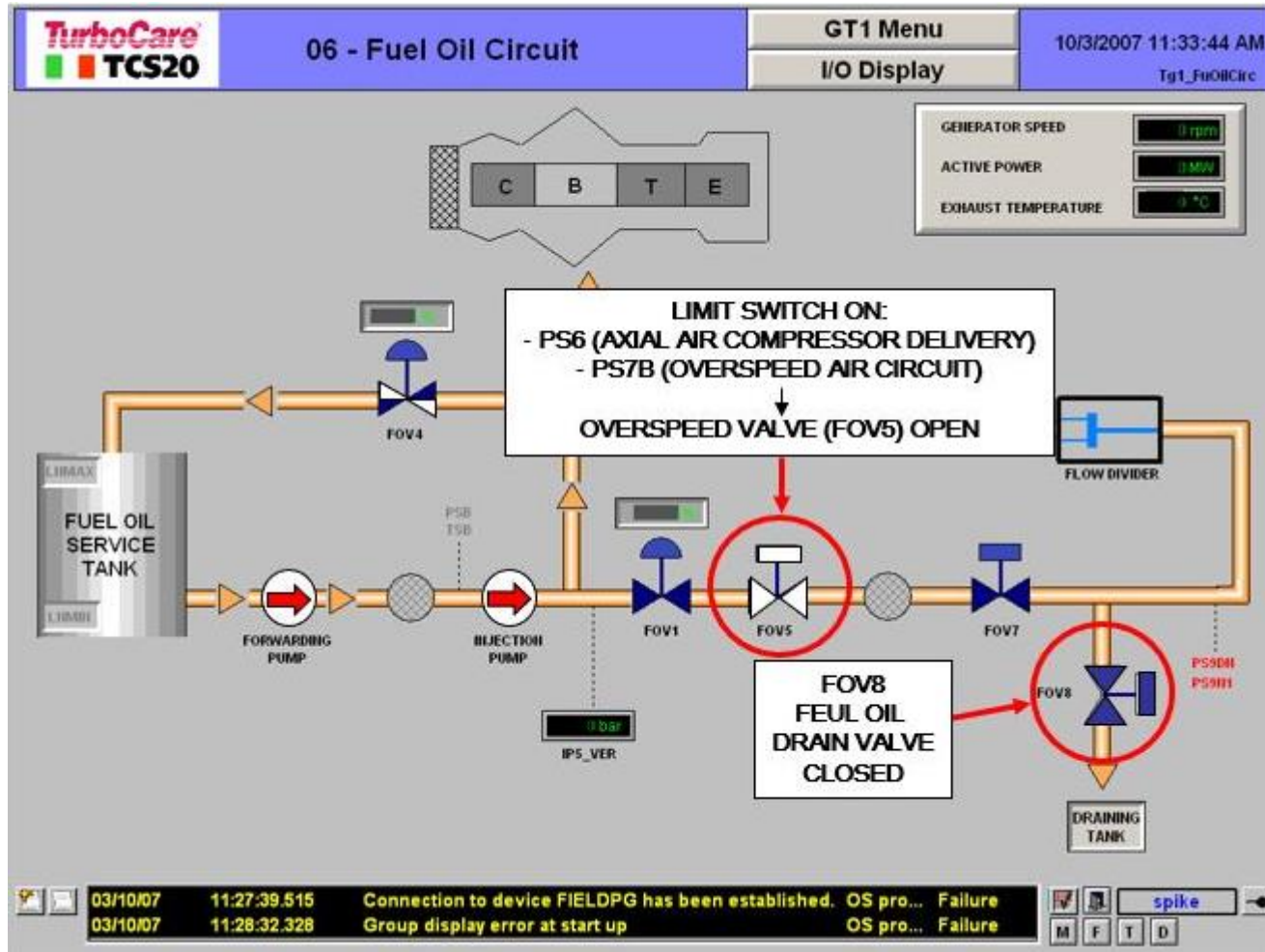
يزداد ضغط زيت الوقود أكثر من ( ٦ بار ) ( IP5 > 6 bar )



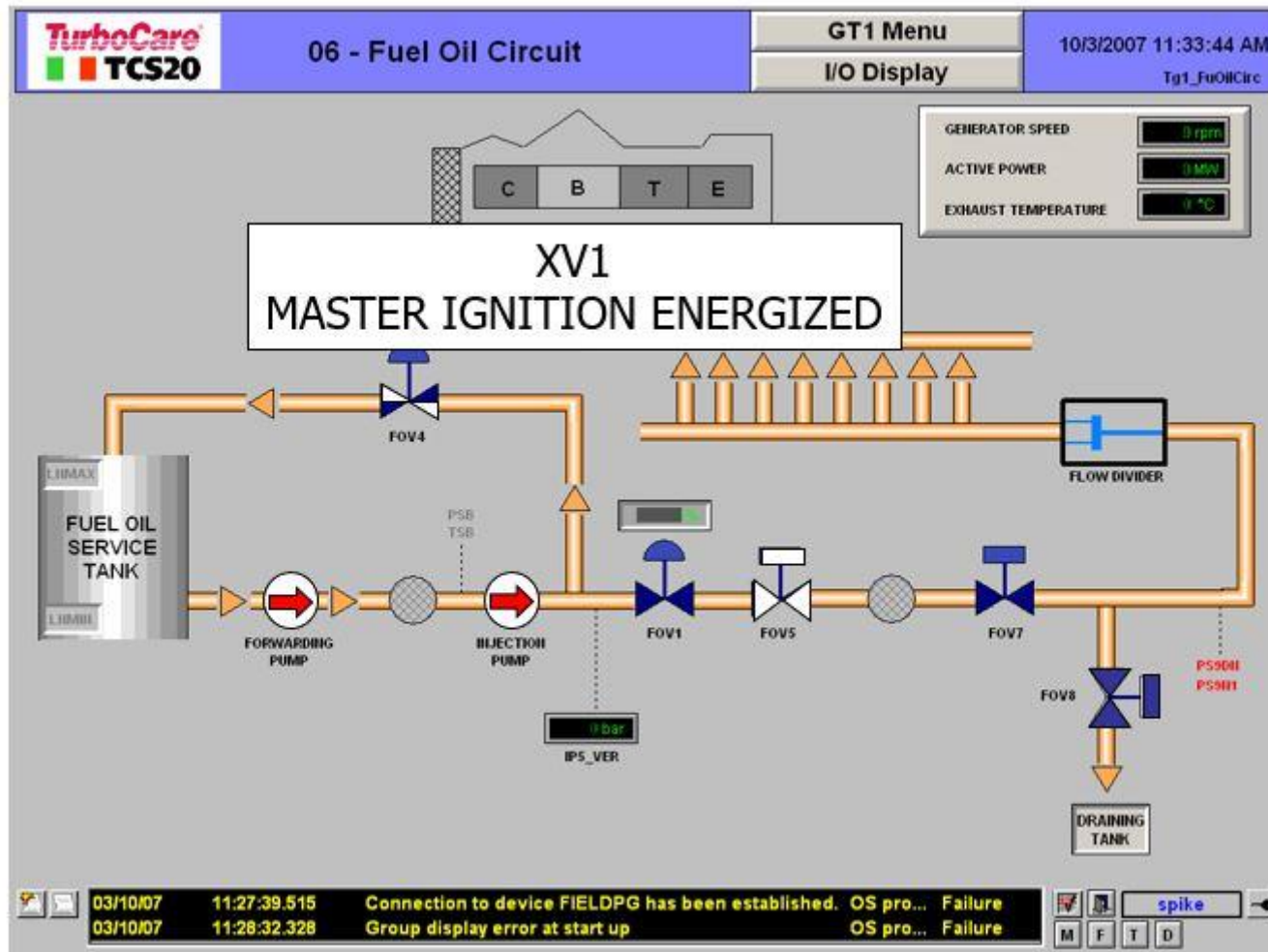
يتم تنظيم ضغط زيت الوقود إلى حوالي (18 بار) عن طريق صمام التدفق الراجع لزيت الوقود (FOV4) FLOW BACK VALVE

حسب حالة الجو ATMOSPHERIC CONDITION

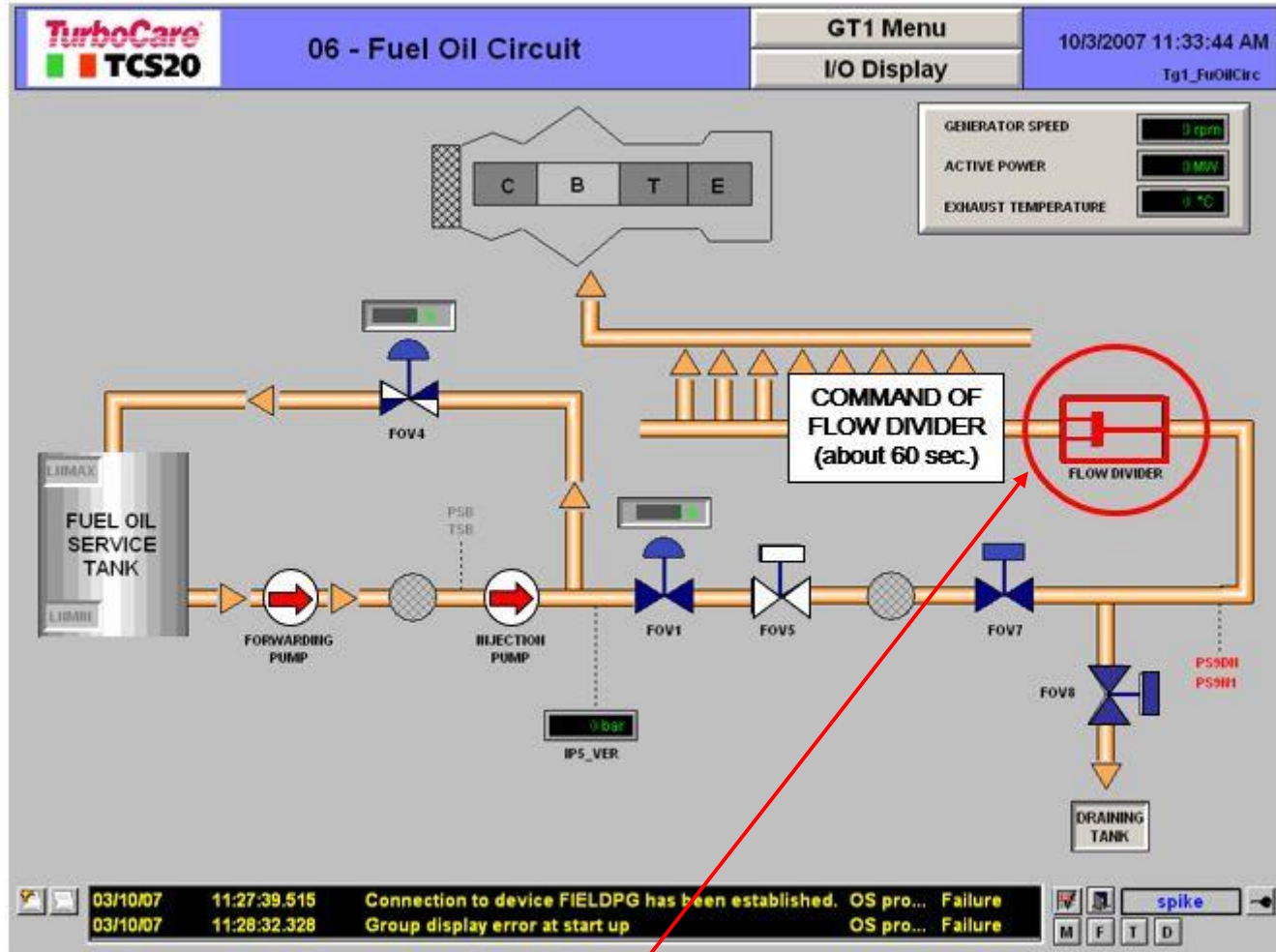




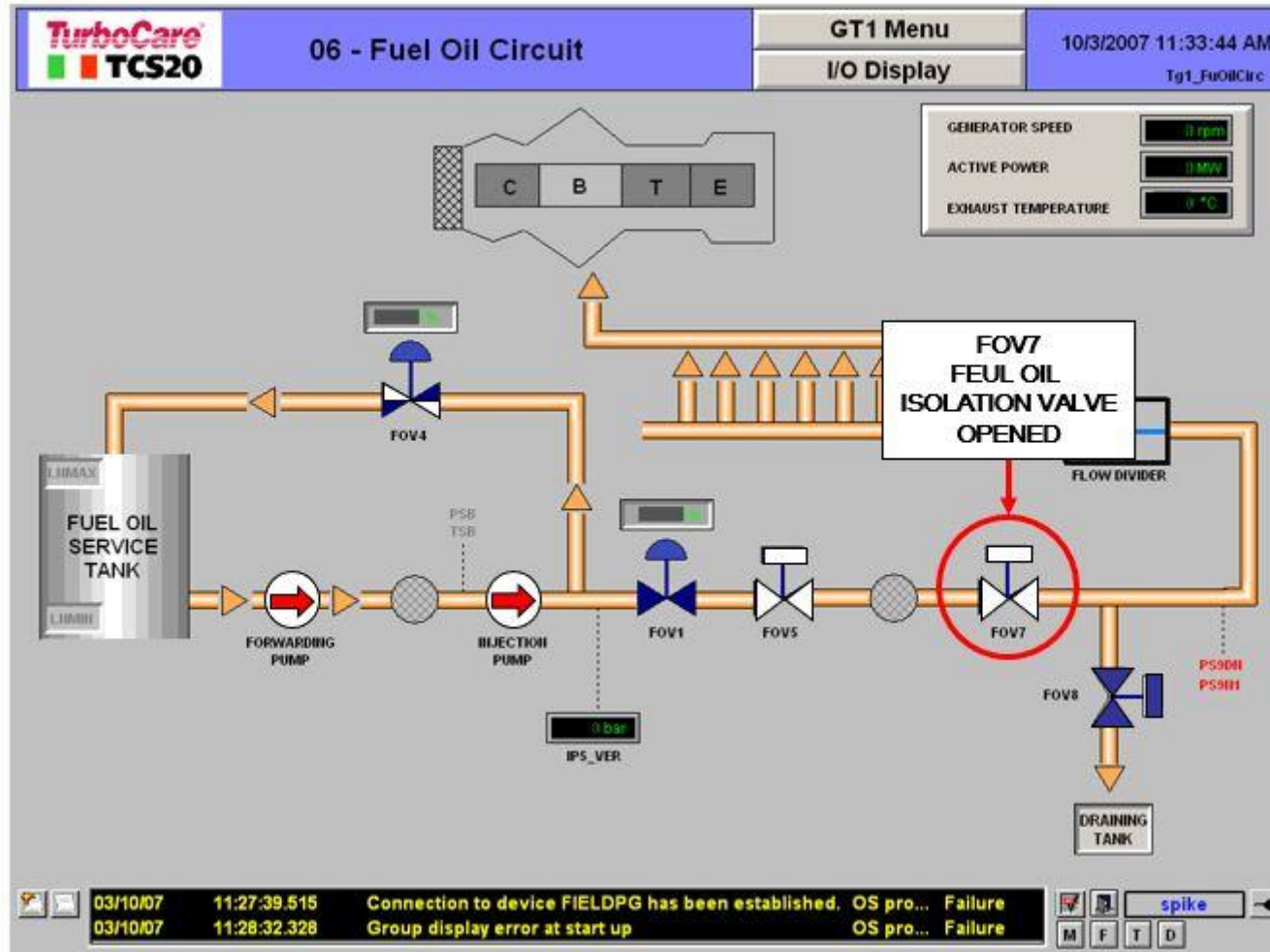
- مفتاح تحديد الضغط على الضغط المنجز لضغط الهواء المحوري في وضع (PS6) ON ، الإعداد أو الضبط عند xx ملي بار (mbar)
- مفتاح تحديد الضغط على دورة الهواء عند السرعة الزائدة (تجاوز السرعة Overspeed) في وضع (PS7B) ON ، الإعداد أو الضبط عند xx ملي بار (mbar) .
- صمام السرعة الزائدة (FOV5) Overspeed valve في وضع فتح OPEN
- صمام تصريف زيت الوقود (FOV8) Fuel oil drain valve في وضع غلق CLOSED



تفعيل أو تنشيط الأشتعال (XV1) MASTER IGNITION ENERGIZED

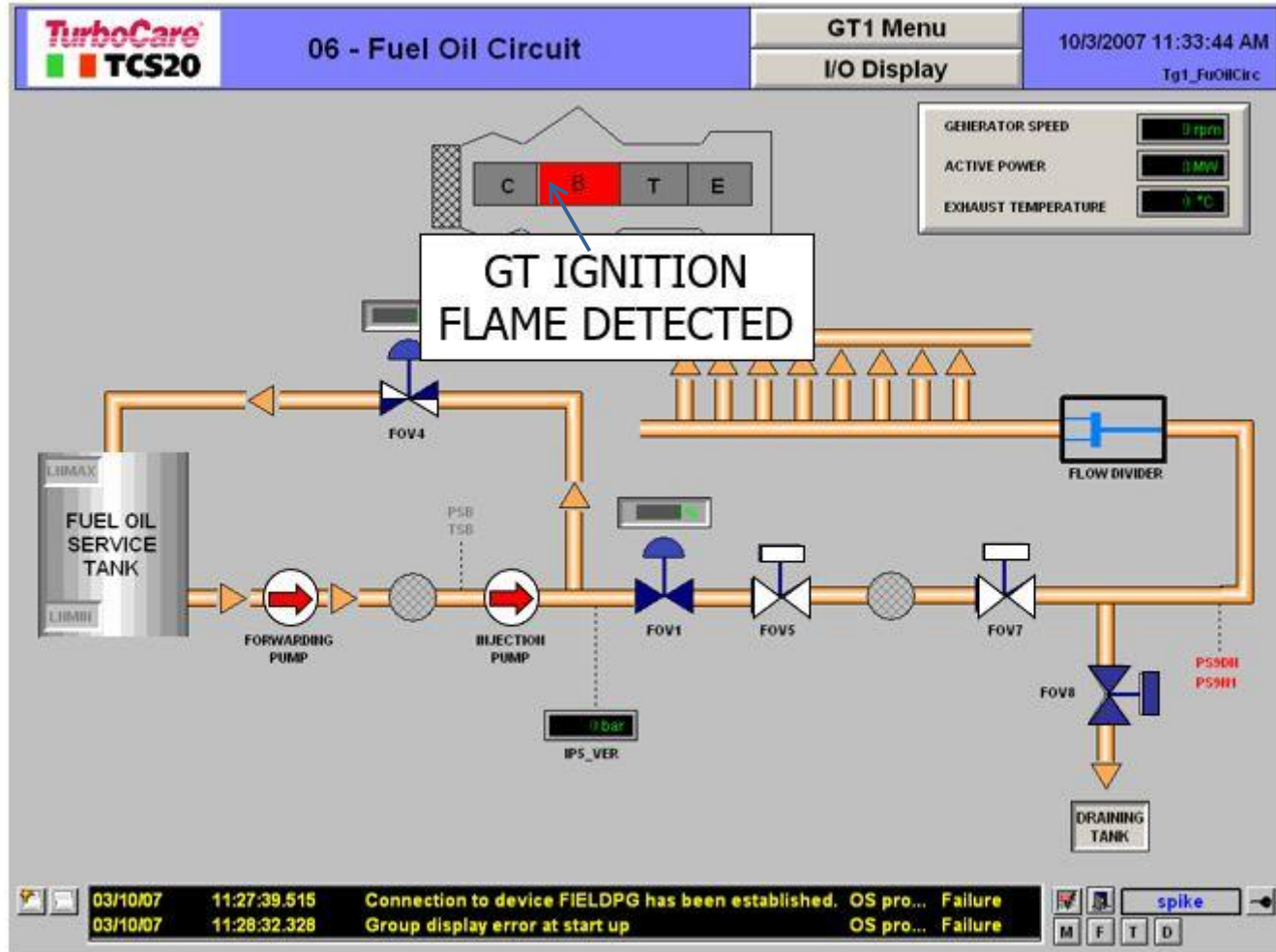


بدء تشغيل مقسم التدفق Flow divider لمدة (٦٠ ثانية) تقريبا

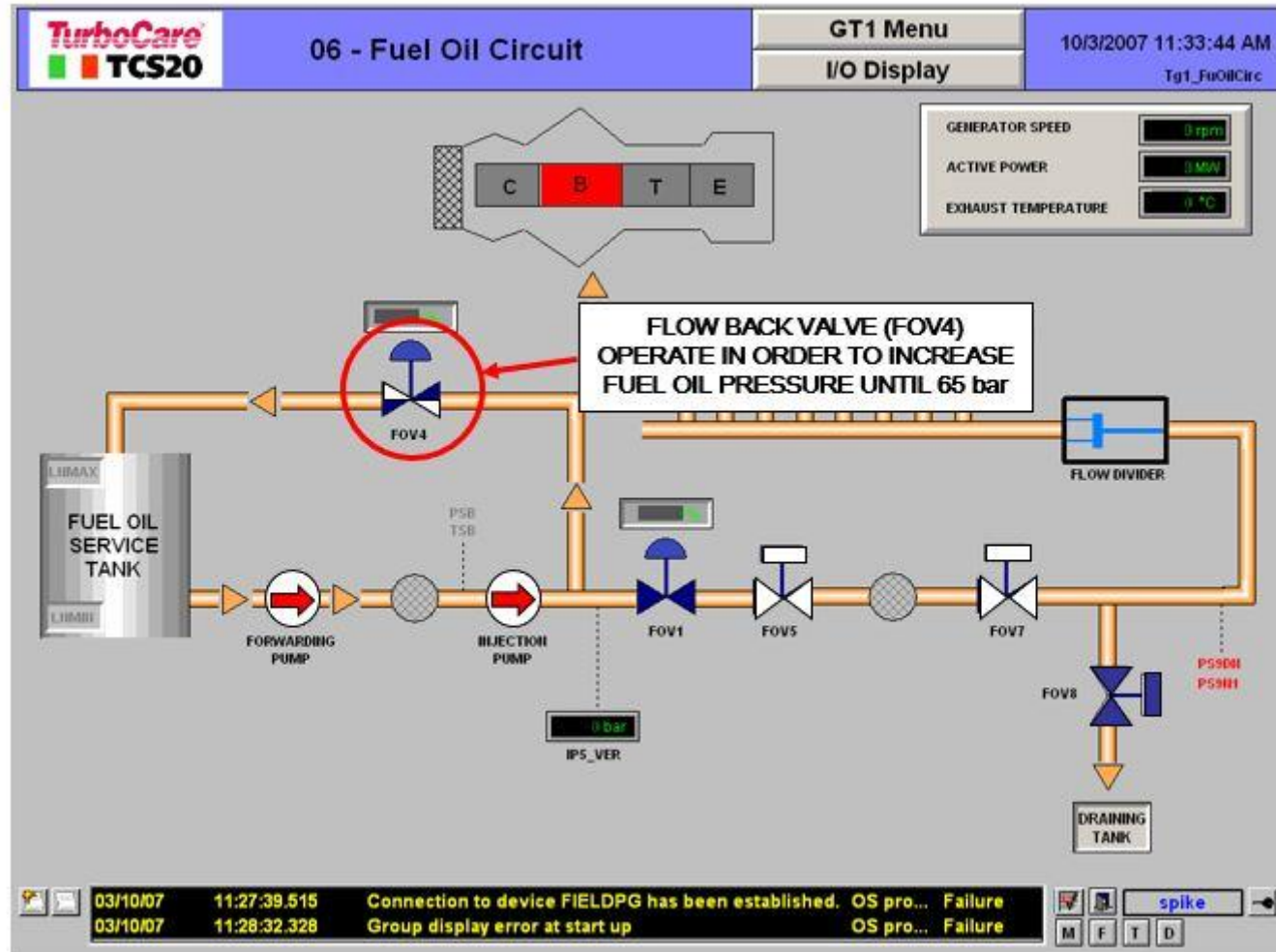


فتح صمام عزل زيت الوقود (FOV7) Fuel oil isolation oil valve (Fuel oil shut-off valve)

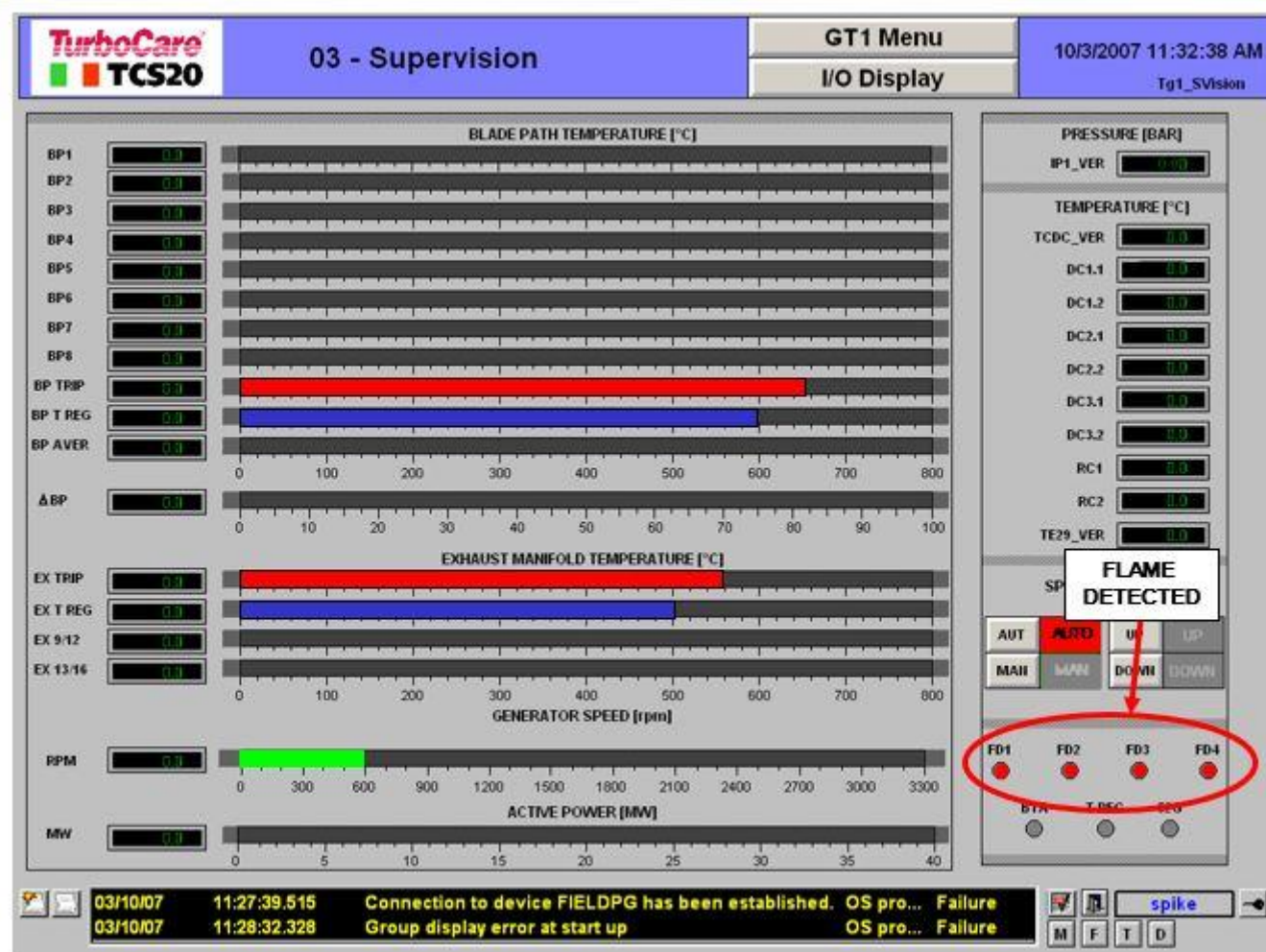




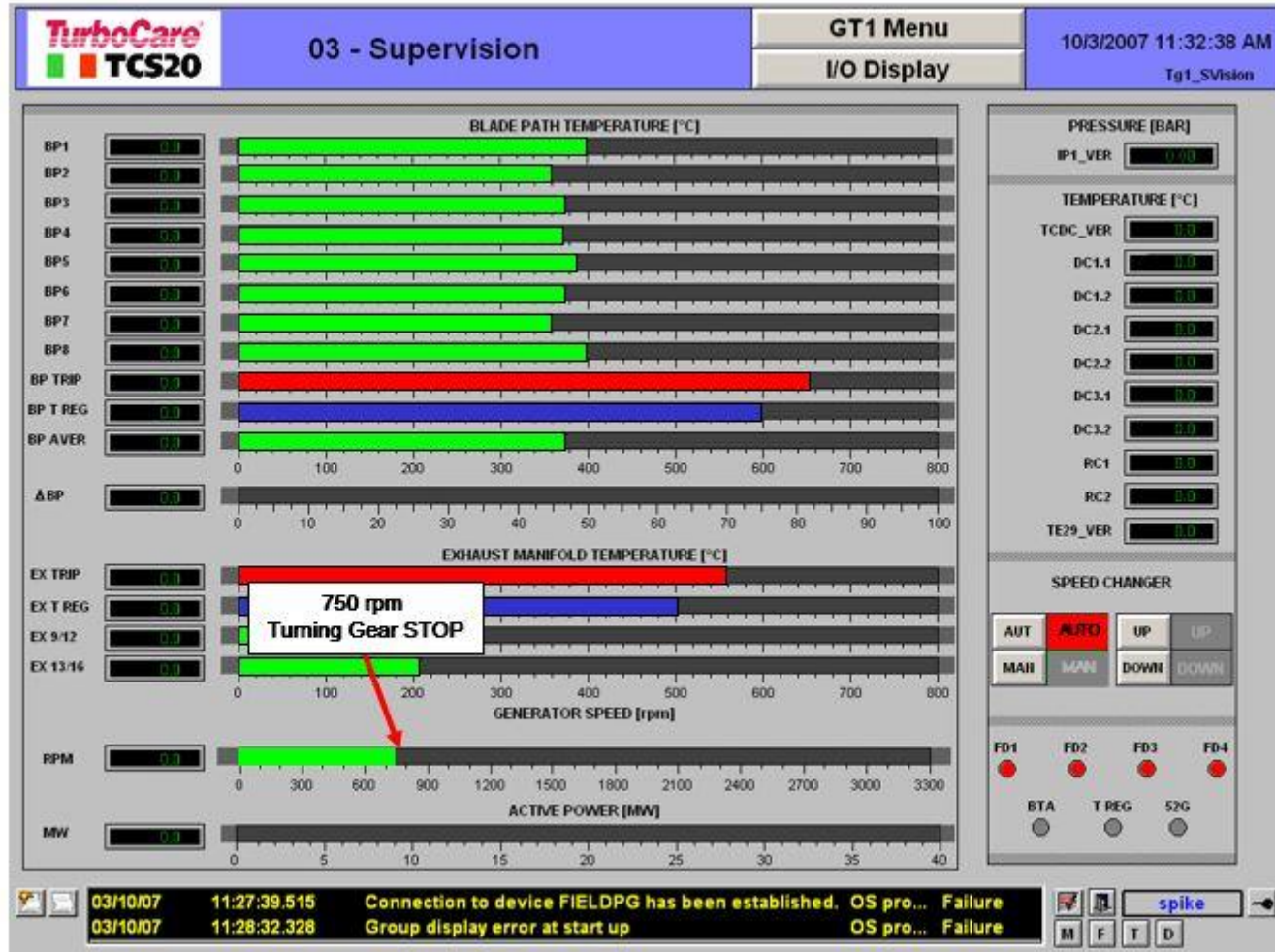
إكتشاف لهب الإشتعال في التوربين الغازي GT IGNITION FLAME DETECTED



يعمل صمام التدفق الراجع لزيت الوقود (FOV4) Fuel oil flow back valve (حسب سرعة التوربين الغازي G.T) من أجل زيادة ضغط الوقود حتى (65 بار bar)

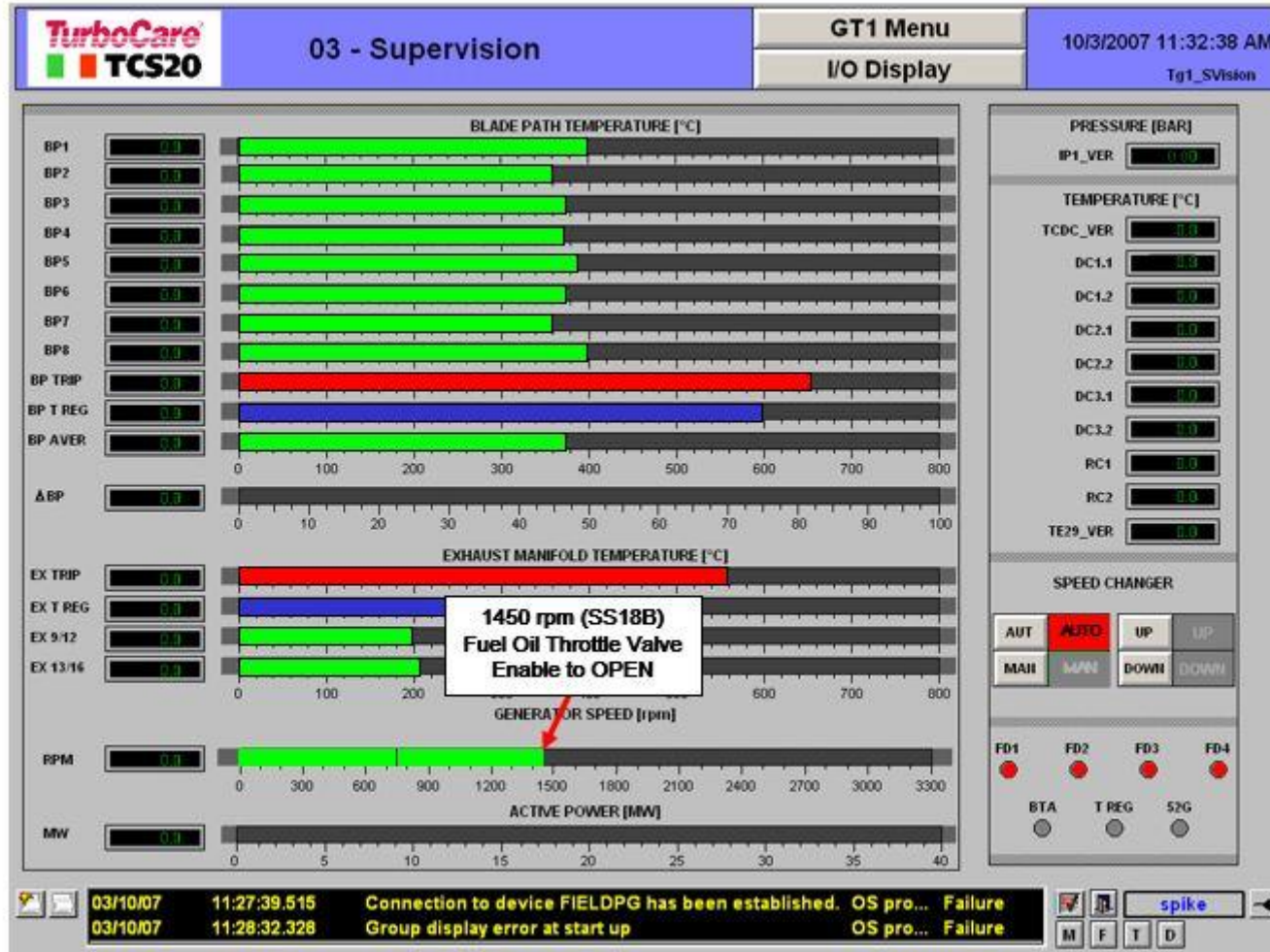


سرعة المولدة GENERATOR SPEED (٦٠٠ دورة في الدقيقة) ، كاشفات اللهب أو الشعلة بالعمل (FD1 , FD2 , FD3 , FD4) FLAME DETECTED  
تحقق من زيادة درجة الحرارة على المزدوجات الحرارية لمسار الريش الحار Blade-Path thermocouples  
(الصفحة الرئيسية للمراقبة والإشراف Supervision)

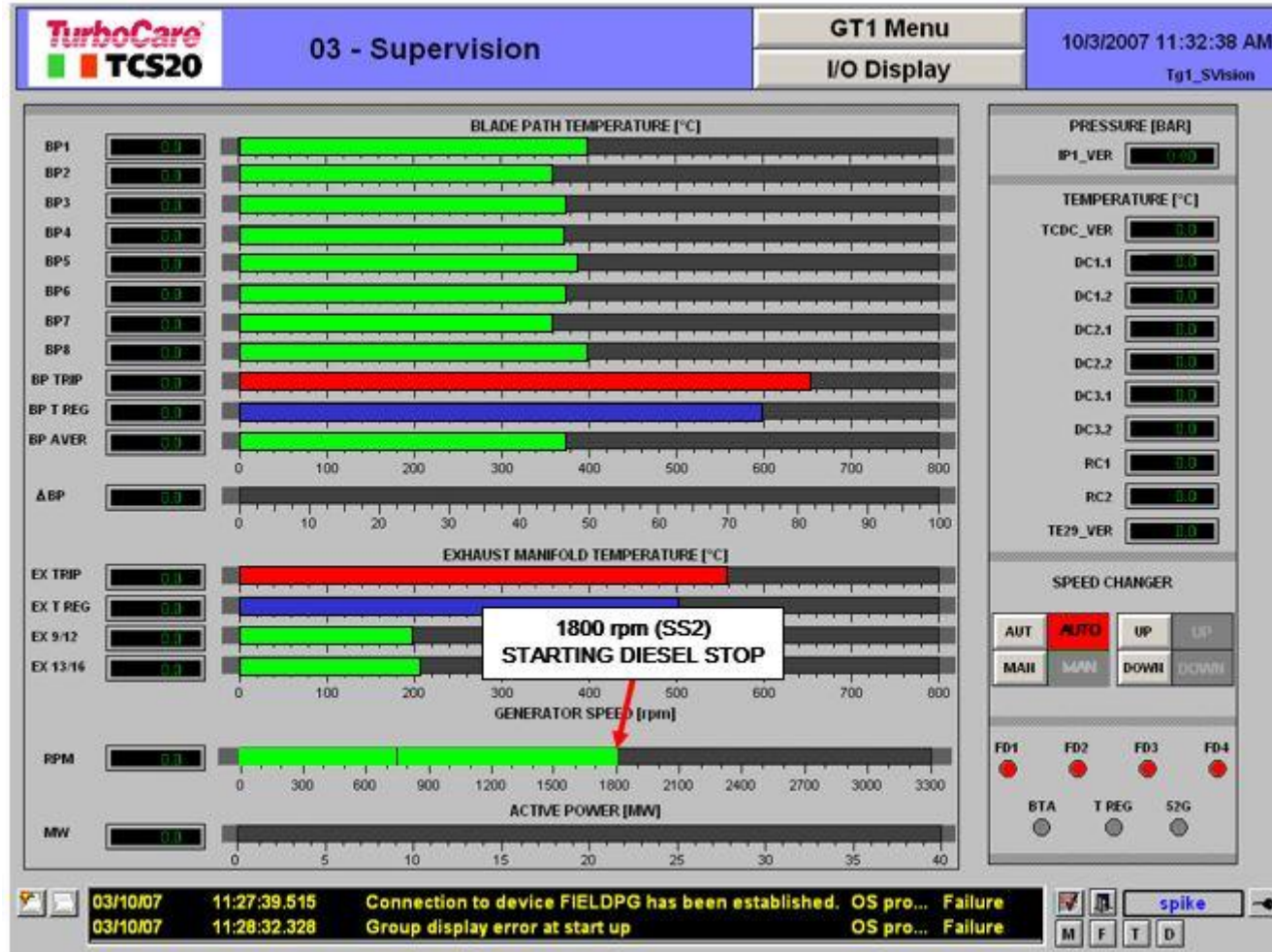


السرعة المرجعية للمولدة GENERATOR SPEED ( ٧٥٠ دورة في الدقيقة ) ، توقف جهاز أو مسنن التدوير البطيء Turning Gear STOP

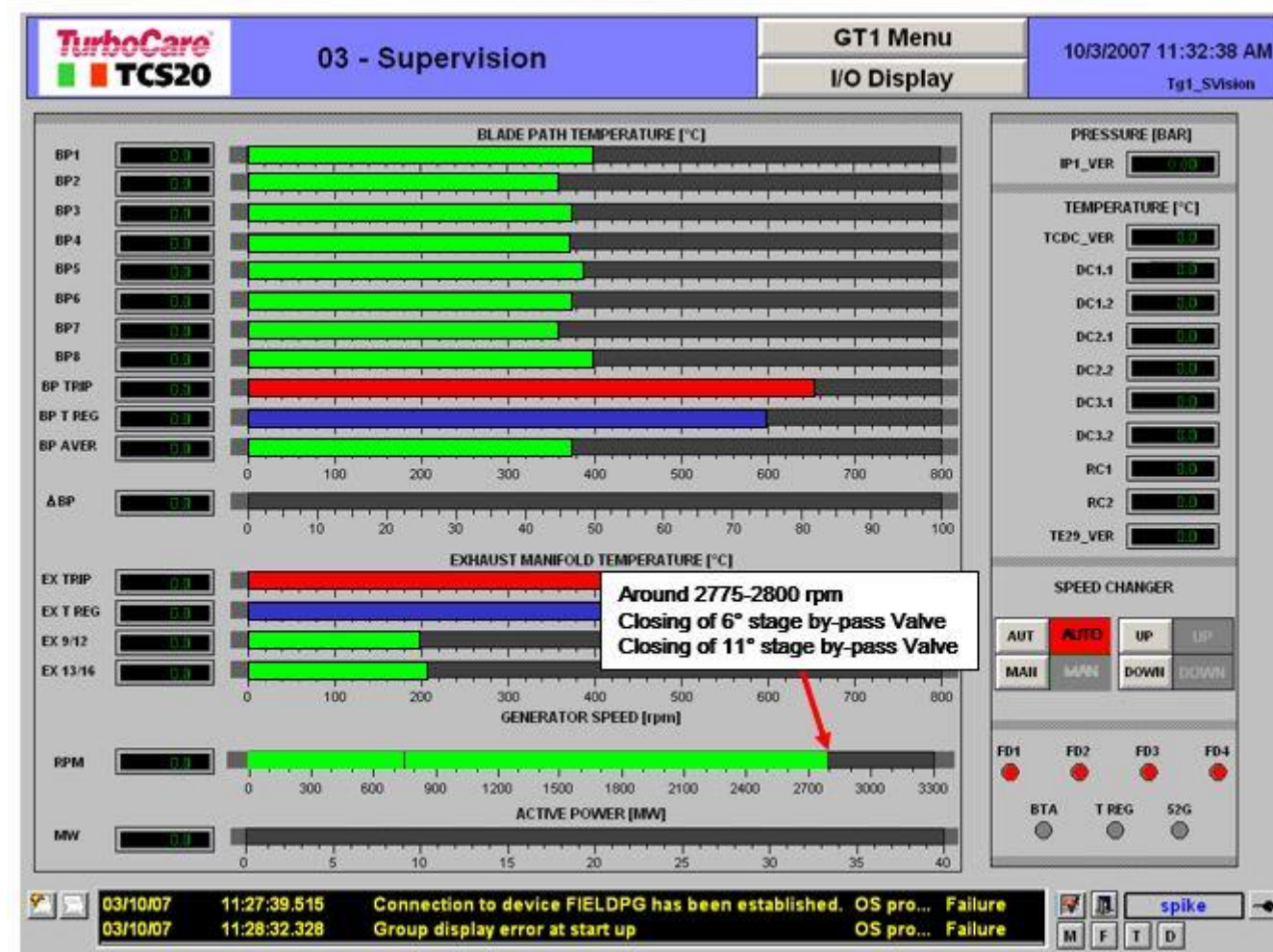




السرعة المرجعية ( ١٤٥٠ دورة في الدقيقة ) ، صمام خنق وقود الغاز (FOV1) Fuel Oil Throttle Valve متاح للفتح حسب الطلب على الوقود

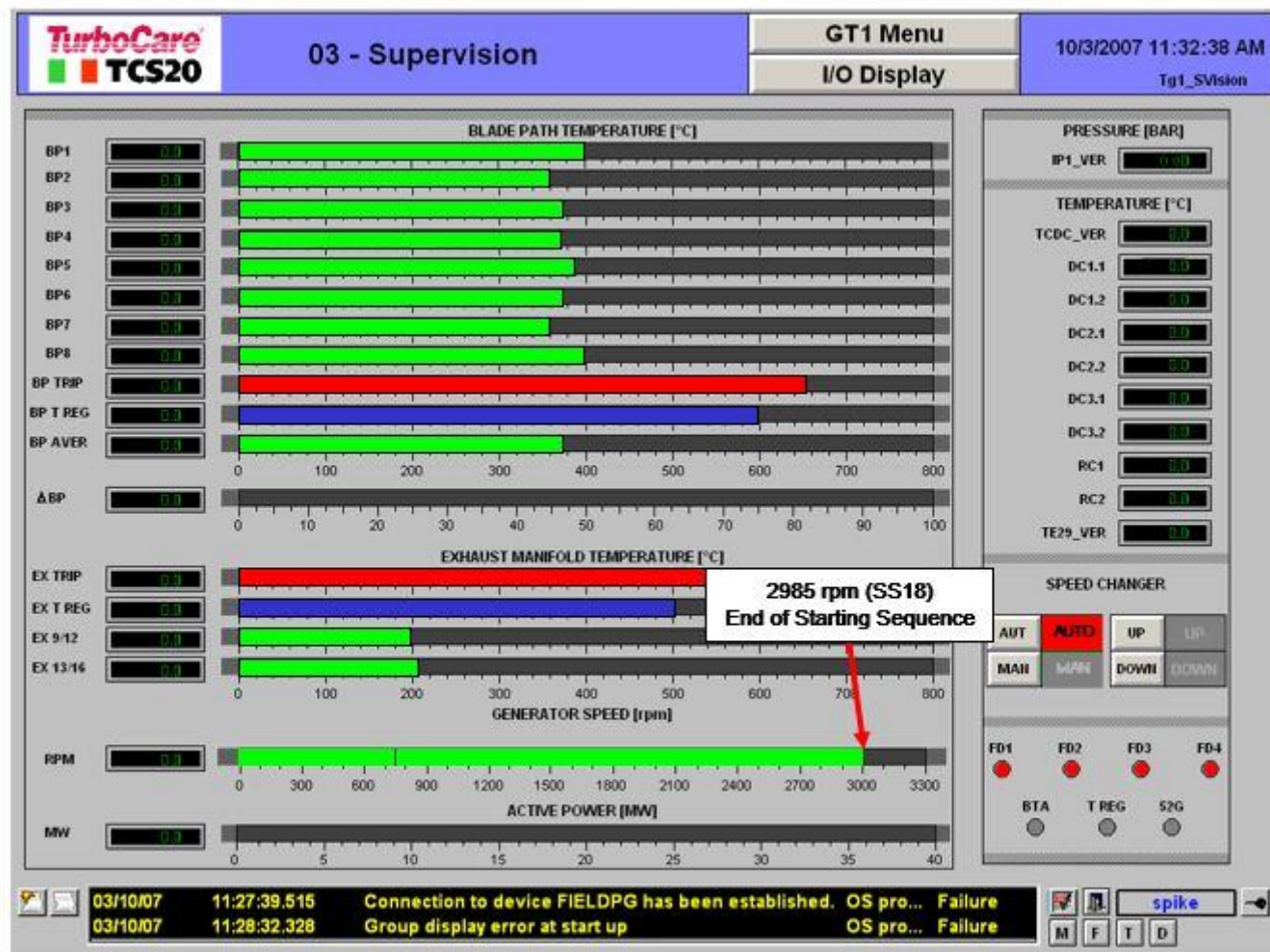


السرعة المرجعية ( ١٨٠٠ دورة في الدقيقة ) ، بدء إيقاف ديزل بدء التشغيل STARTING DIESEL STOP والتشغيل في حالة التبريد ( ٣٠٠ دورة في الدقيقة ) لمدة ( ٣ دقائق )



سرعة المولدة حوالي (2775-2800 دورة في الدقيقة) ، إغلاق صمام الإلتفاف للمرحلة السادسة (VBP6) 6° stage by-pass valve ، وصمام الإلتفاف للمرحلة الحادية عشر (VBP11) 11° stage by-pass valve





السرعة المرجعية ( ٢٩٨٥ دورة في الدقيقة ) ، نهاية تسلسل خطوات بدء التشغيل End of Starting Sequence ، مغير السرعة Speed changer تحت سيطرة جهاز التزامن Synchronizer ، المحثة Exciter في وضع ON



بدء تشغيل زيت الوقود (نهاية تسلسل الإجراءات) : FUEL OIL START UP (End of Sequence)

The screenshot shows the '02 - Starting Sequence' screen of a TurboCare TCS20 control panel. The top bar includes the TurboCare logo, the sequence name, a 'GT1 Menu' button, an 'I/O Display' button, and the date/time '10/31/2007 11:31:23 AM' with 'Tg1\_StartSeq' below it. The main area contains a grid of status indicators and control buttons. A central callout box highlights the 'TURNING GEAR MOTOR RUNNING' indicator and the '750 rpm Turning Gear STOP' message. The bottom status bar shows connection logs and a 'spike' button.

Indicator	Status
TCS SELECTORS IN AUTO	Green
M.C.C. CONSENT	Green
STARTING DIESEL CONSENT	Green
COMBUSTIBLE CONSENT	Green
BY-PASS VALVES OPEN	Green
TURNING GEAR MOTOR RUNNING	Green (circled)
REV. CLUTCH ENGAGED	Green
AUXILIARY OIL TEMP. CONSENT	Green
PSD	Green
PROTECTION CONSENT	Green
STARTING CONSENT	Green
STARTING SIGNAL IN OBSOLETE	Red
PSG	Yellow
PS7B	Yellow
SPURK-PLUGS COMM	Red
CVL	Red
CVR	Red
PSA	Red
PSA	Red
BY-PASS VALVES CLOSED	Red
STARTING END	Red

Control buttons and indicators include: SPEED CHANGER (AUTO, MAN), EMERGENCY OIL PUMP (ON, OFF), AUXILIARY OIL PUMP (ON, OFF), OVERSPEED VALVE (ON, OFF), FUEL SELECTION (GAS, CHANGE, FUEL OIL), TEST (STARTING TEST, OVERSPEED TEST, SPEED DROOP TEST, SIMULATION TEST), SPEED DROOP CONTROL, POWER CONTROL, STARTING TURBINE (TURBINE RUNNING, START), STOP TURBINE (STOP), TDPU (180 sec.), GENERATOR SPEED (0 rpm), ACTIVE POWER (0 MW), EXHAUST TEMPERATURE (0 °C).

Status bar logs: 03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure; 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

توقف جهاز أو مسنن التدوير البطيء Turning Gear STOP عند السرعة (٧٥٠ دورة في الدقيقة)

**TurboCare** TCS20 **02 - Starting Sequence** **GT1 Menu** 10/3/2007 11:31:23 AM  
**I/O Display** Tg1\_StartSeq

PCS SELECTORS STARTING DIESEL IN OPERATION	M.C.C. CONSENT PS6	STARTING DIESEL CONSENT PS7B	COMBUSTIBLE CONSENT SPURK-PLUGS COMMAND	BY-PASS VALVES OPEN ON	TURBINE GEAR MOTOR RUNNING ON	OIL CLUTCH ENGAGED ON	LUBE OIL TEMP. CONSENT ON	PS7	PROTECTION CONSENT BY-PASS VALVES CLOSED	STARTING CONSENT STARTING END
---	-----------------------	---------------------------------	--	---------------------------	----------------------------------	--------------------------	------------------------------	-----	---	----------------------------------

**1800 rpm STARTING DIESEL STOP**

MAN MAN DOWN DOWN MAN MAN AUTO AUTO MAN MAN OFF AUTO MAN OFF ON

EMERGENCY OIL PUMP ON OFF AUXILIARY OIL PUMP ON OFF OVERSPEED VALVE ON OFF FUEL SELECTION GAS CHANGE FUEL OIL TEST STARTING TEST OVERSPEED TEST SPEED DROOP TEST SIMULATION TEST

SPEED DROOP CONTROL POWER CONTROL STARTING TURBINE TURBINE RUNNING START STOP STOP TURBINE STOP

TDPU 180 sec. GENERATOR SPEED 0 rpm ACTIVE POWER 0 MW EXHAUST TEMPERATURE 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

توقف محرك ديزل بدء التشغيل STARTING DIESEL STOP عند السرعة (١٨٠٠ دورة في الدقيقة)

**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | **10/3/2007 11:31:23 AM**  
**I/O Display** | **Tg1\_StartSeq**

TCS SELECTORS IN AUTO	R.L.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTION CONSENT	<b>BY-PASS VALVES OPEN</b>	TURBINE GEAR MOTOR RUNNING	ISS CLUTCH ENGAGED	LOWR. OIL TEMP. CONSENT	PSO	PROTECTION CONSENT	STARTING CONSENT
STARTING DIESEL IN OPERATION	PSG	PS7B	SPURK-PLUGS COMMAND	VAL	VAL	VAL	VAL	VAL	<b>BY-PASS VALVES CLOSED</b>	STARTING END

**2775-2800 rpm BY-PASS VALVES CLOSED**

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**SPEED CHANGER**  
 UP UP  
 DOWN DOWN

**DRAINING GAS CONDENSATE VALVE**  
 AUT AUTO  
 MAN MAN

**FUEL CHARGE-OVER**  
 AUT AUTO  
 MAN MAN

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**

**POWER CONTROL**

**STARTING TURBINE**  
 TURBINE RUNNING  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 180 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike

M F T D

غلق الصمامات الإلتفافية أو التحويلية BY-PASS VALVES CLOSED عند السرعة (2775-2800 دورة في الدقيقة)

**TurboCare TCS20** | **02 - Starting Sequence** | **GT1 Menu** | 10/3/2007 11:31:23 AM  
**I/O Display** | Tg1\_StartSeq

PCS SELECTORS IN AUTO	M.C.C. CONSENT	STARTING DIESEL CONSENT	COMBUSTIBLE CONSENT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	SSS CLUTCH ENGAGED	LUBE OIL TEMP CONSENT	PSY	PROTECTION CONSENT	CONSENT
STARTING DIESEL IN OPERATION	PS6	PS7B	SPURK-PLUGS COMMAND	ON	OFF	OFF	OFF	OFF	BY-PASS VALVES CLOSED	DESTARTING END

**2985 rpm (SS18)**  
**END OF STARTING SEQUENCE**

**SPEED CHANGER**  
 AUT AUTO  
 MAN MAN

**DRAWING GAS CONDENSATE VALVE**  
 AUT AUTO  
 MAN MAN

**EMERGENCY OIL PUMP**  
 ON OFF

**AUXILIARY OIL PUMP**  
 ON OFF

**OVERSPEED VALVE**  
 ON OFF

**FUEL SELECTION**  
 GAS CHANGE FUEL OIL

**TEST**  
 STARTING TEST  
 OVERSPEED TEST  
 SPEED DROOP TEST  
 SIMULATION TEST

**SPEED DROOP CONTROL**  
 POWER CONTROL

**STARTING TURBINE**  
 TORQUE BURNING  
 START

**STOP TURBINE**  
 STOP

**TDPU**  
 0 sec.

**GENERATOR SPEED** 0 rpm  
**ACTIVE POWER** 0 MW  
**EXHAUST TEMPERATURE** 0 °C

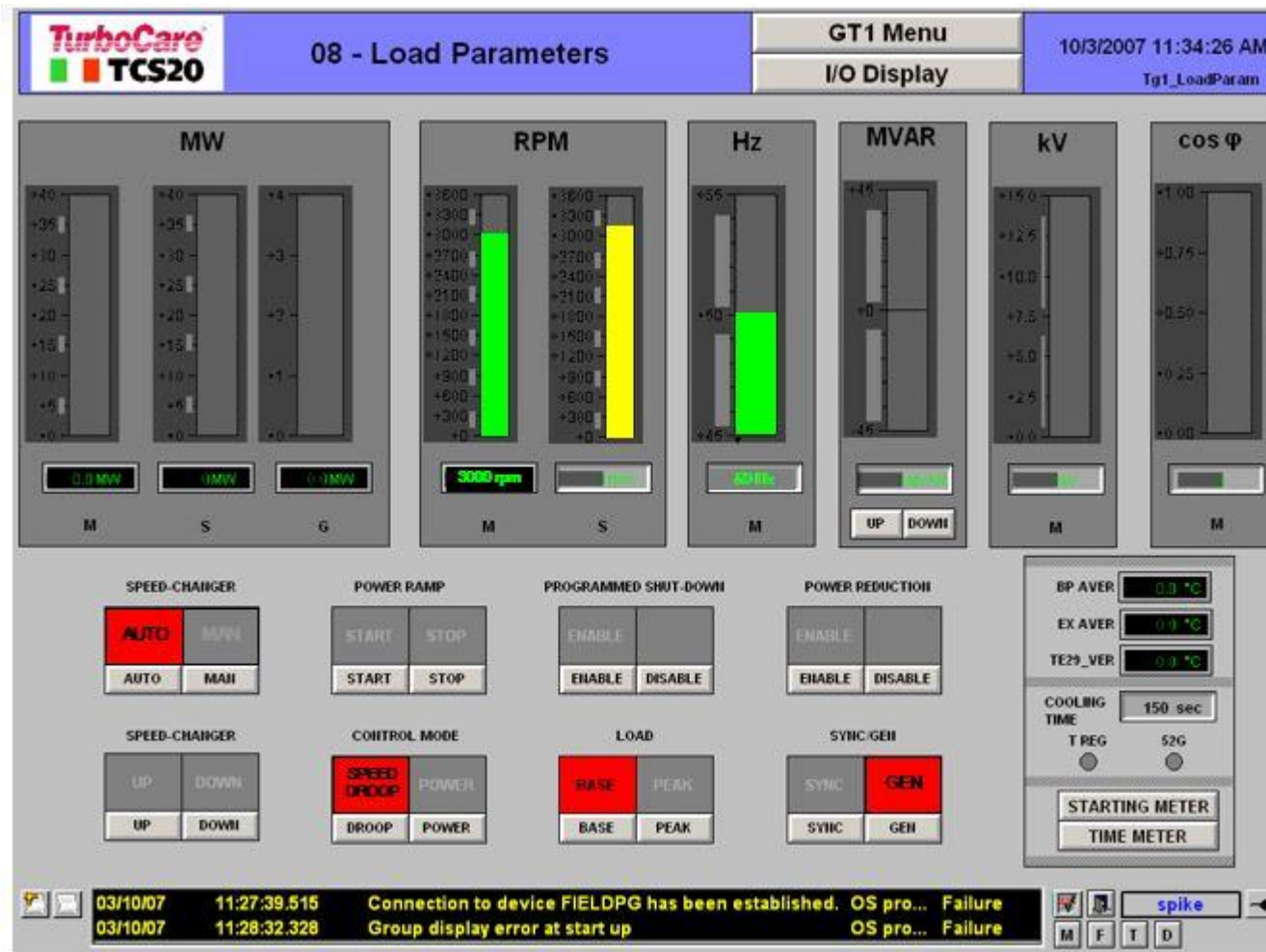
03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
 03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike M F T D

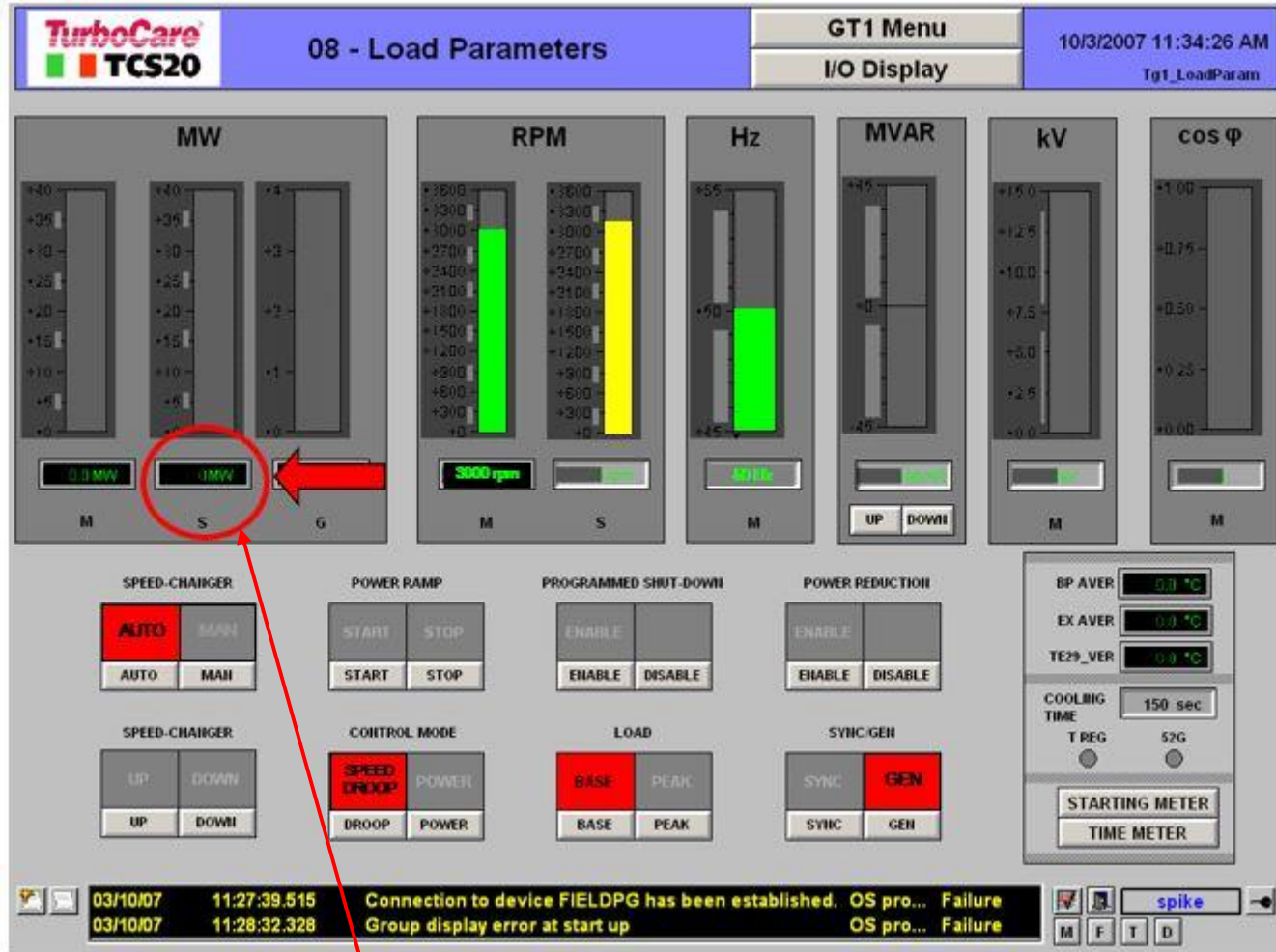
نهاية تسلسل خطوات بدء التشغيل END OF STARTING SEQUENCE عند السرعة ( ٢٩٨٥ دورة في الدقيقة)



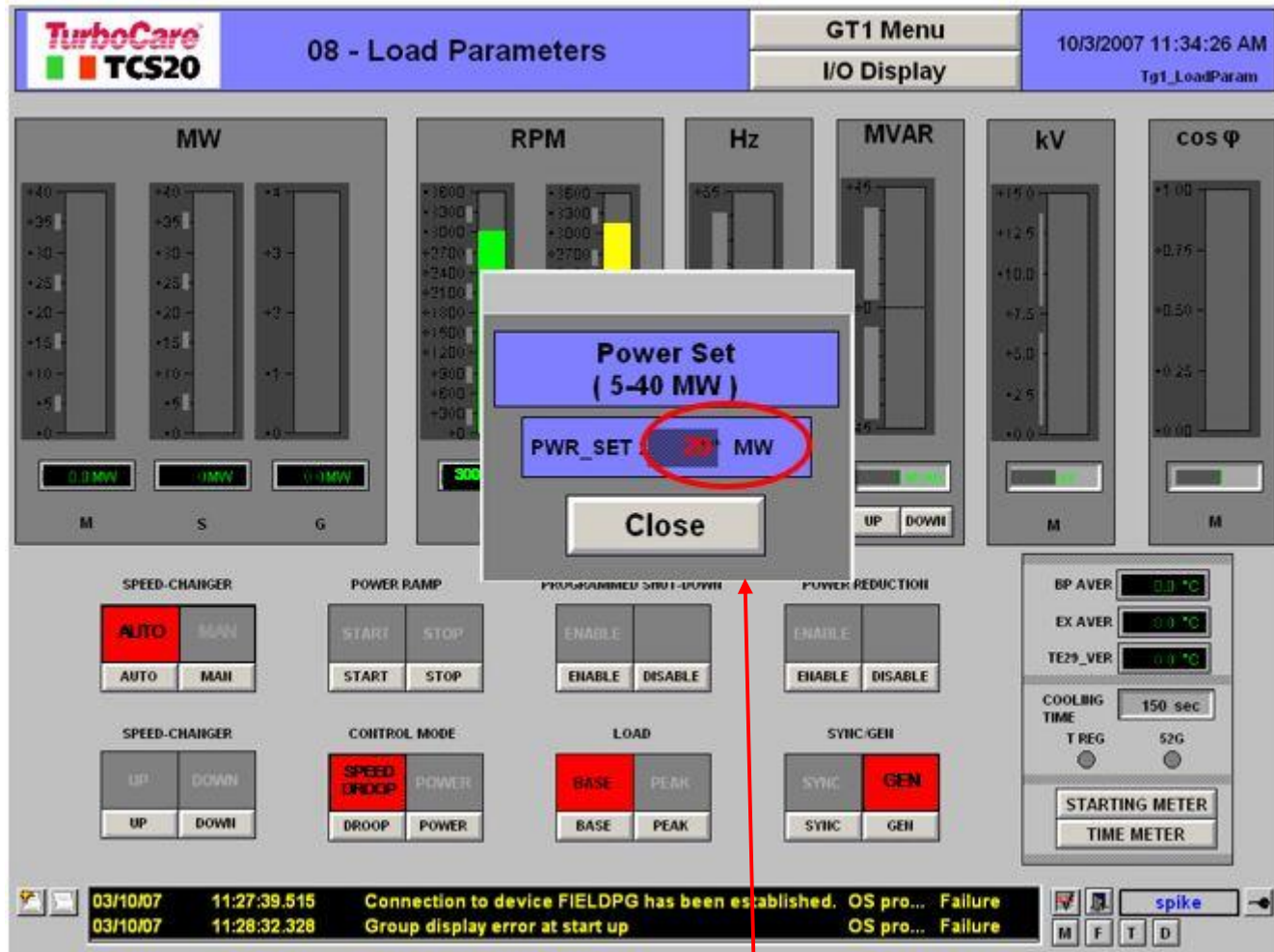
تحميل التوربين (ضبط القدرة والتدرج) (TURBINE LOADING (power set and gradient) ، التدرج يعني الحمل \ الوقت :



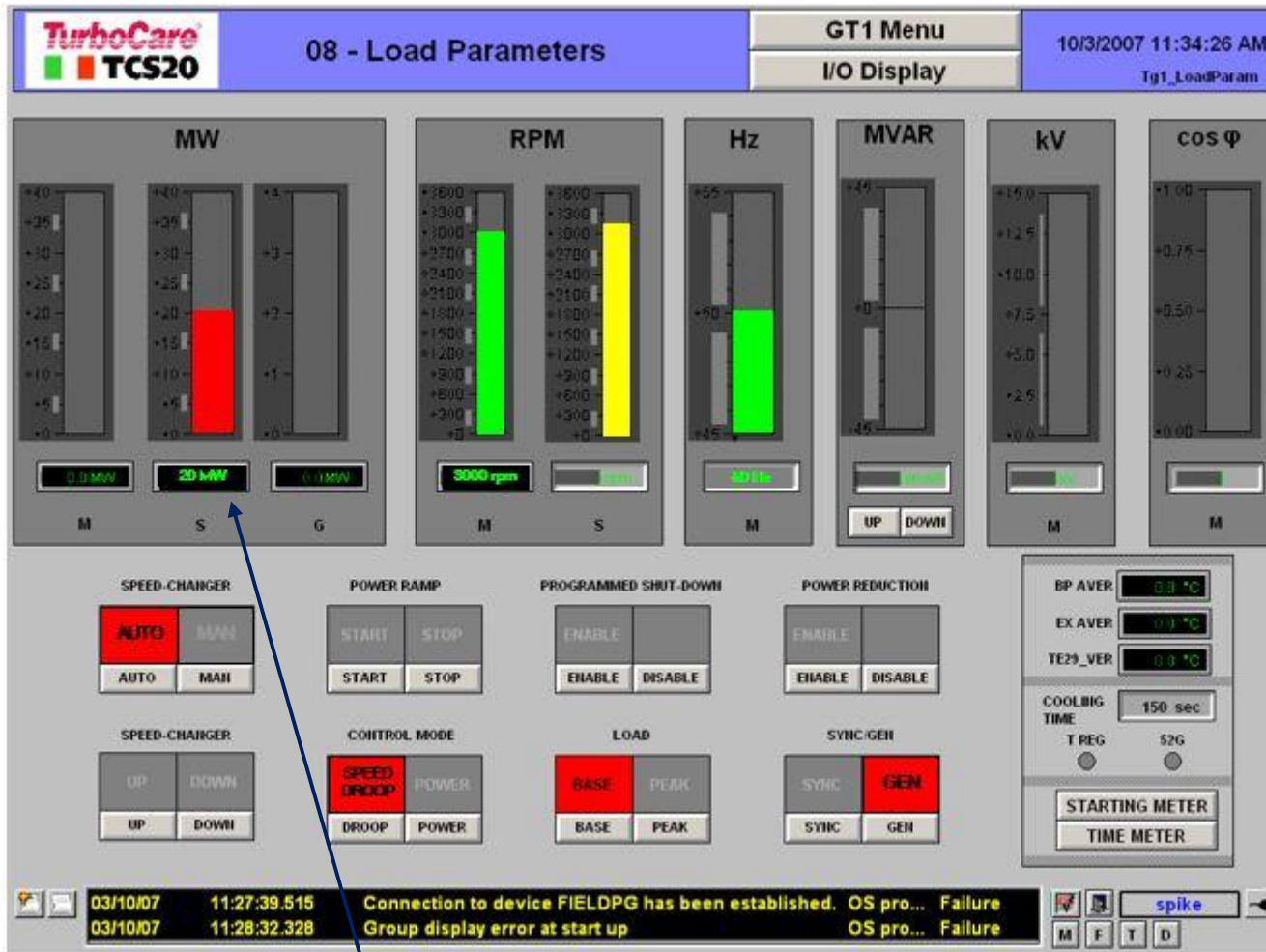
الصفحة الرئيسية لمعالم أو متغيرات الحمل Load Parameters



لإنشاء الضبط أو الإعدادات ، حدد زر الضغط S (MW)

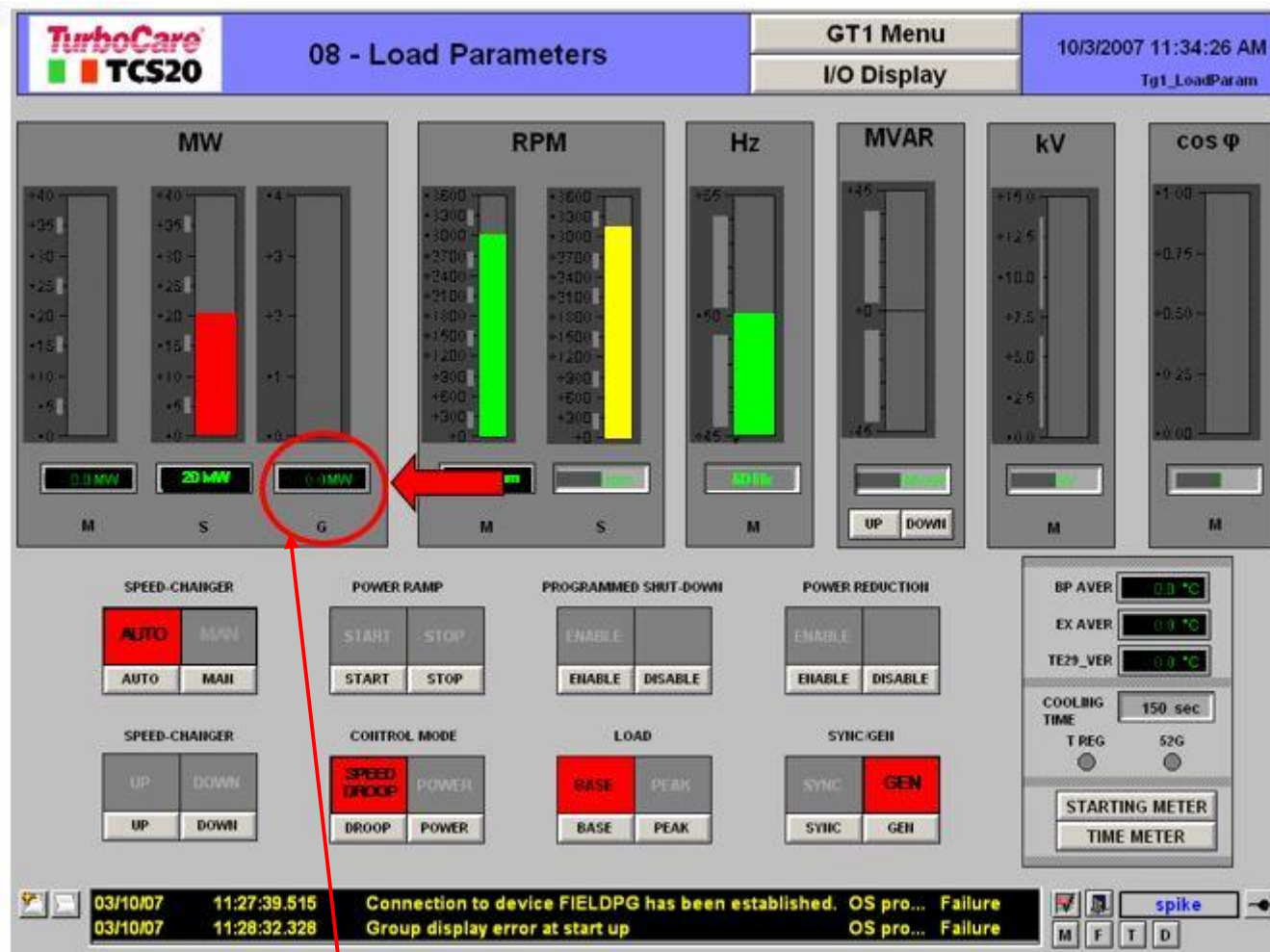


وأختار القيمة (مثلا ٢٠ ميكرواط) ، في النافذة المقابلة (ضبط القدرة Power Set ) (من ٥ إلى ٤٠ ميكرواط ) (from 5 - 40 MW)

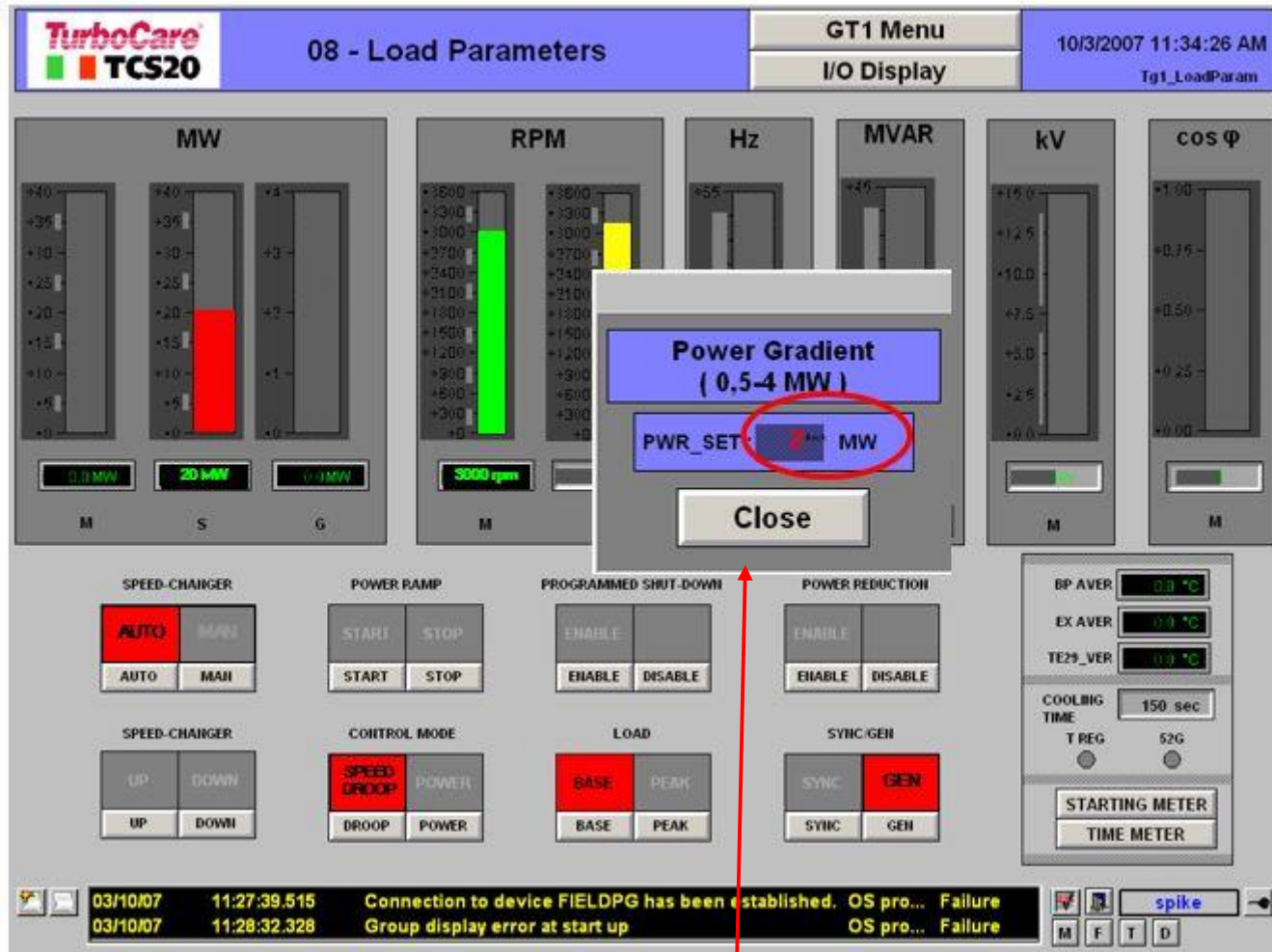


تم تحديد قيمة الحمل (٢٠ ميكرواط)

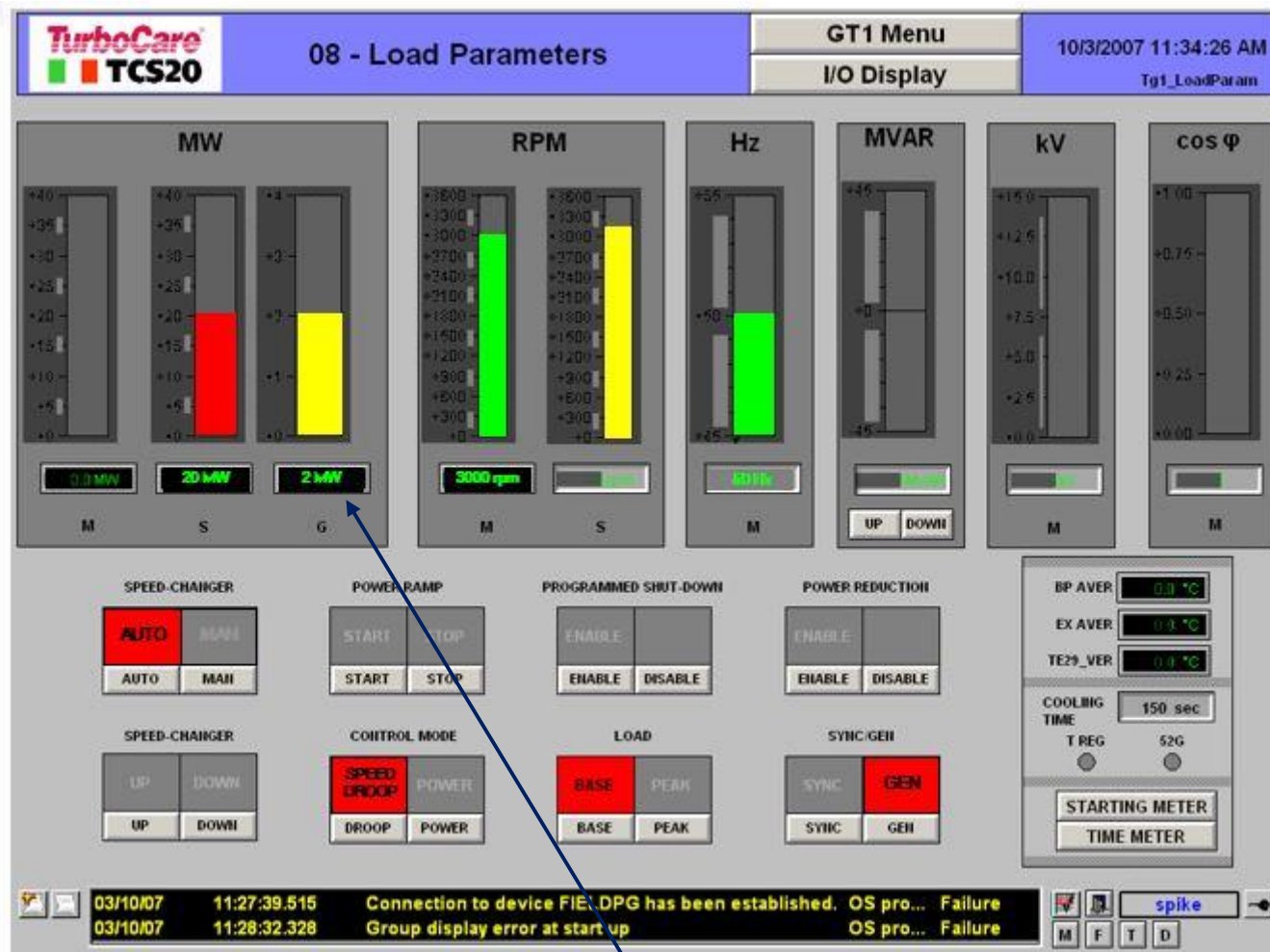




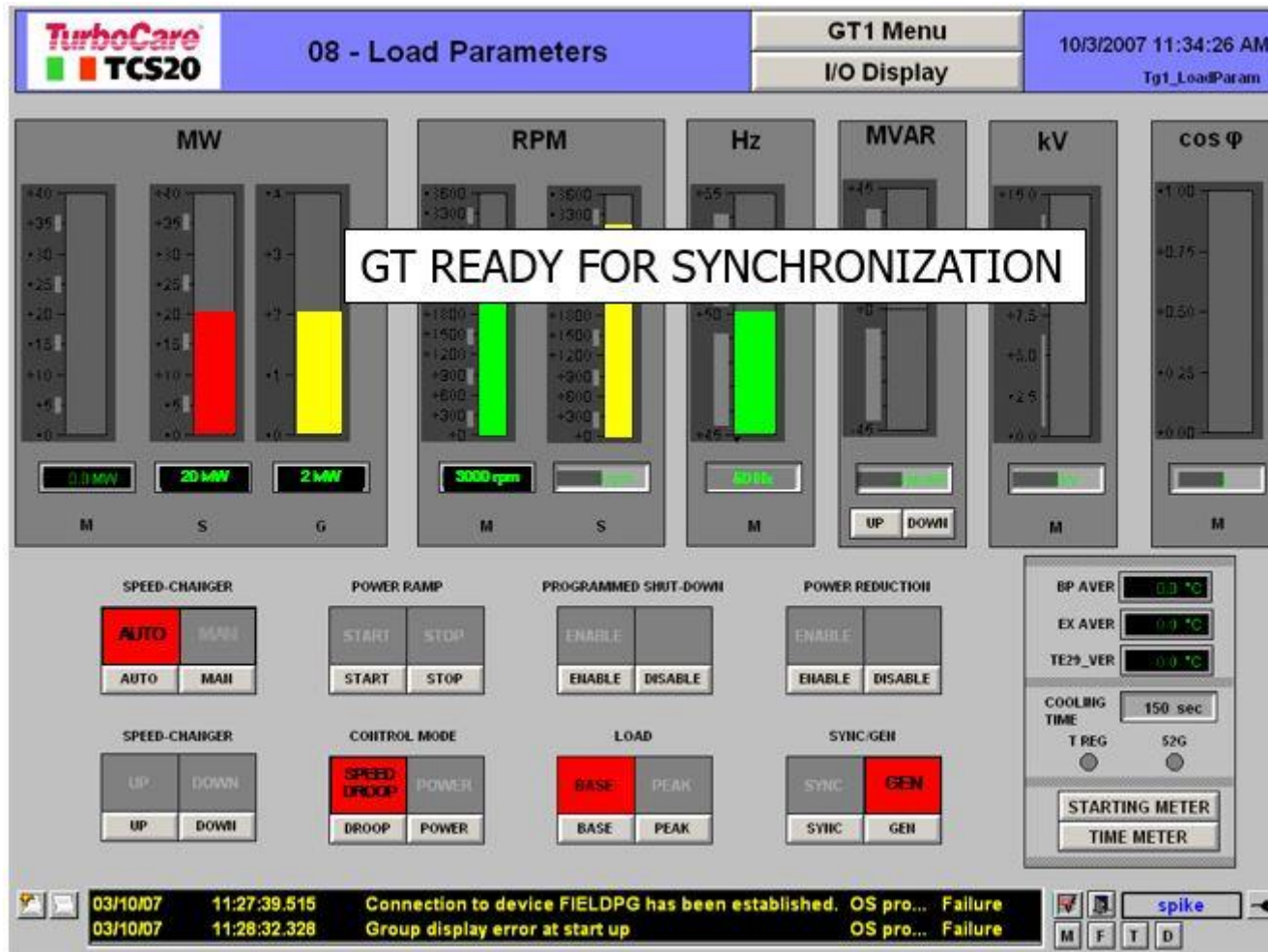
زيادة تدرج الحمل للتوربين الغازي بتحديد زر الضغط G (MW)



وأختر ، في النافذة المقابلة (تدرج القدرة Power Gradient ) ، القيمة (من ٠,٥ إلى ٤ ميكاواط أدقيقة) (from 0.5 to 4 MW/min)



تم تحديد قيمة تدرج الحمل ( ٢ ميكرواط | دقيقة )



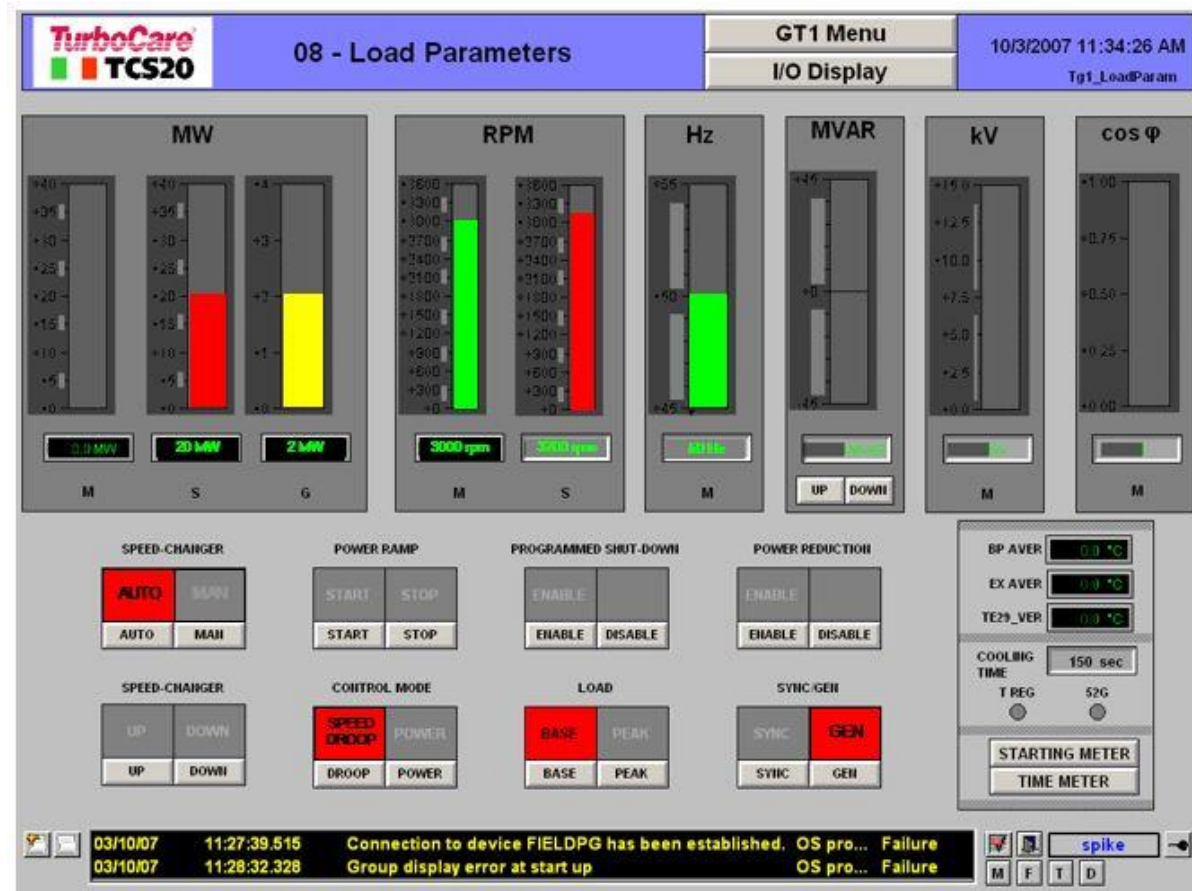
التوربين الغازي GT جاهز للمزامنة Synchronization

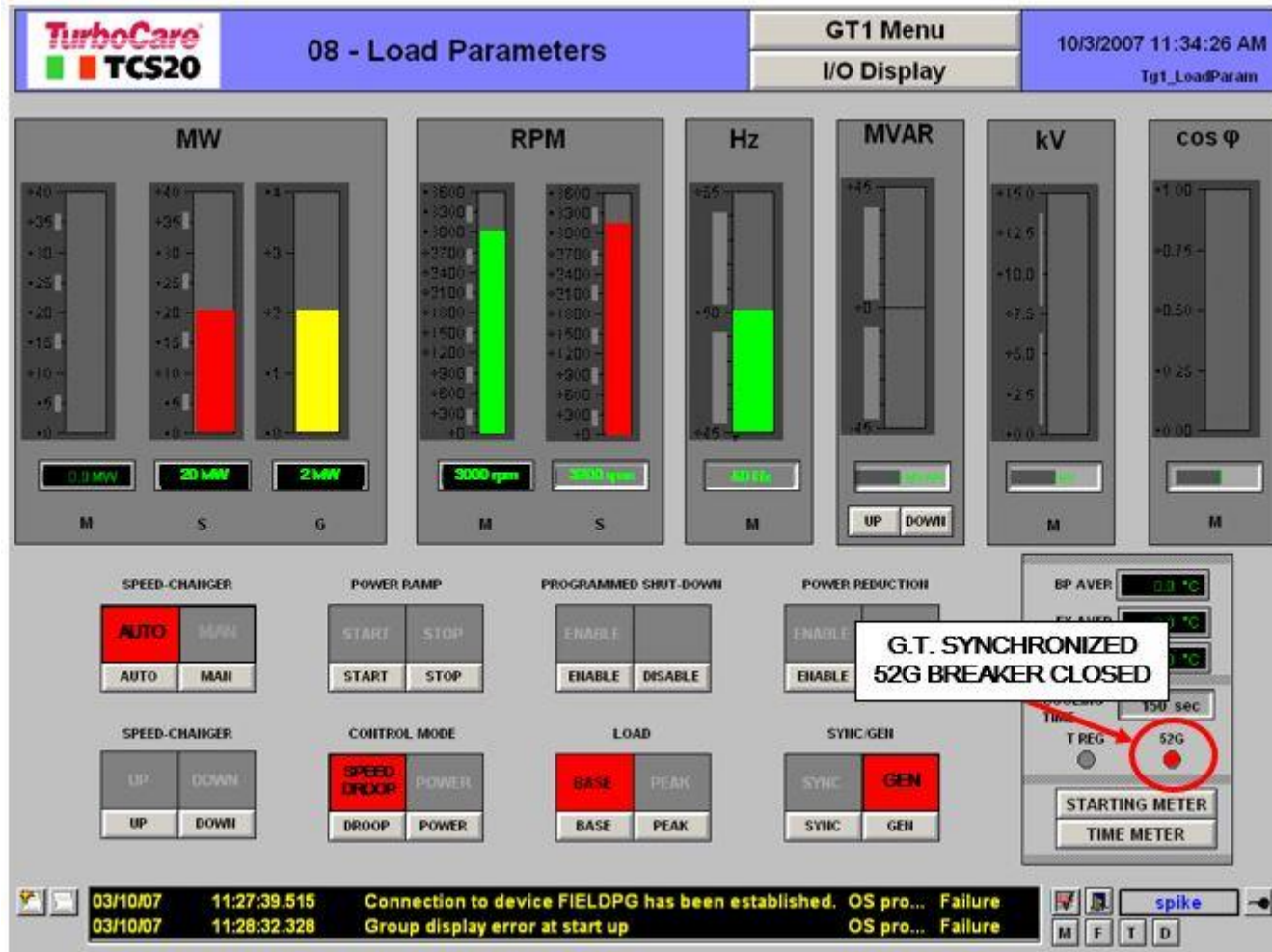


## تحميل التوربين (التزامن) : Turbine Loading (Synchronization)

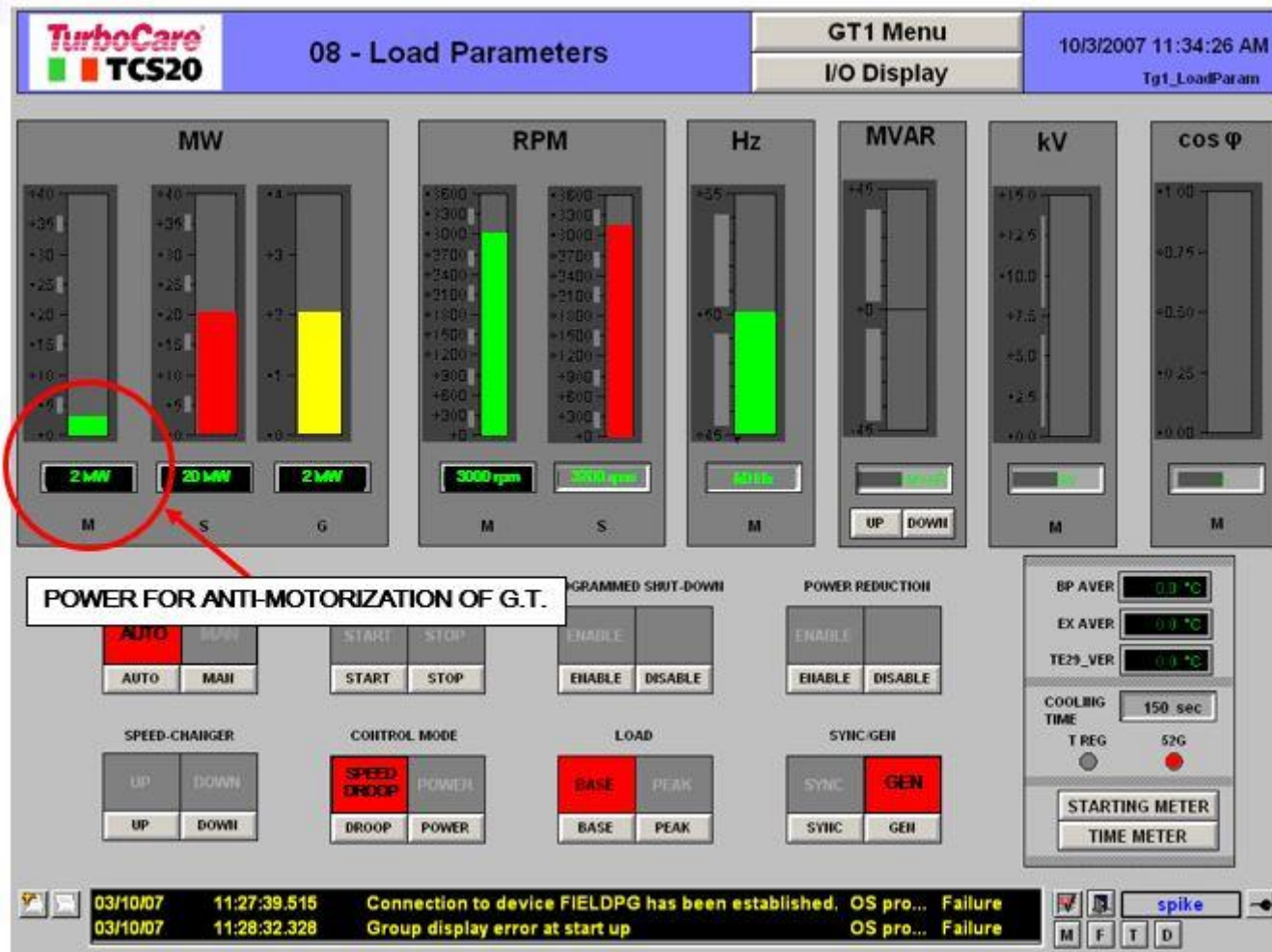
- عندما يتم التحقق من جميع الشروط المذكورة أعلاه ، فإن التوربين الغازي G.T. يكون جاهز للتزامن Synchronization .
- يجب أن يكون المُشغل مؤهلاً بالكامل لإتخاذ الإجراءات اللازمة لمزامنة الوحدة .
- جميع عمليات مزامنة الوحدة تتم في كابينة المولدة Generator Cabinet .

## تحميل التوربين (صعود الحمل) : Turbine Loading (load ramp)

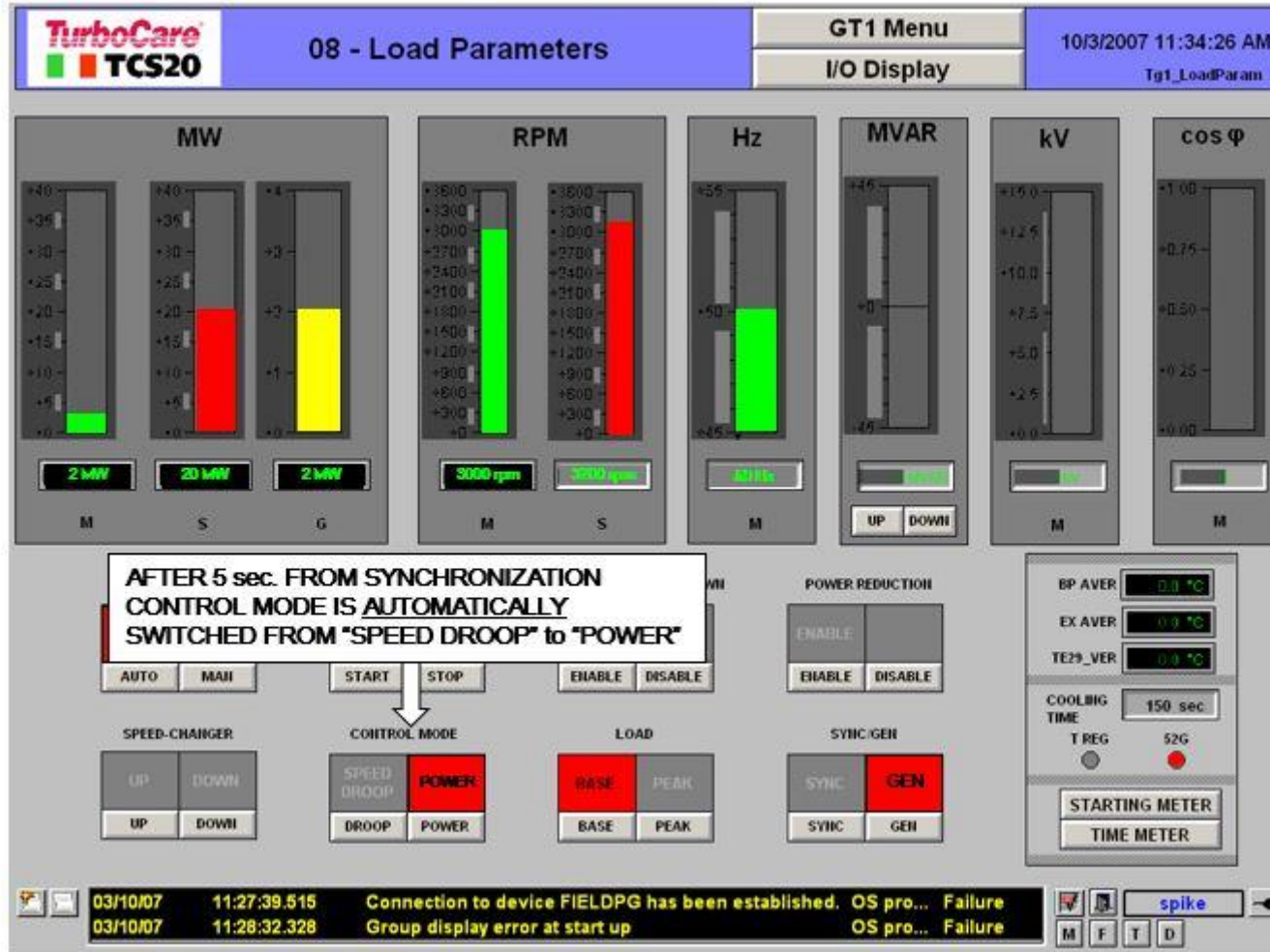




التوربين الغازي متزامن ، قاطع الدورة Breaker ( 52G ) مُغلق

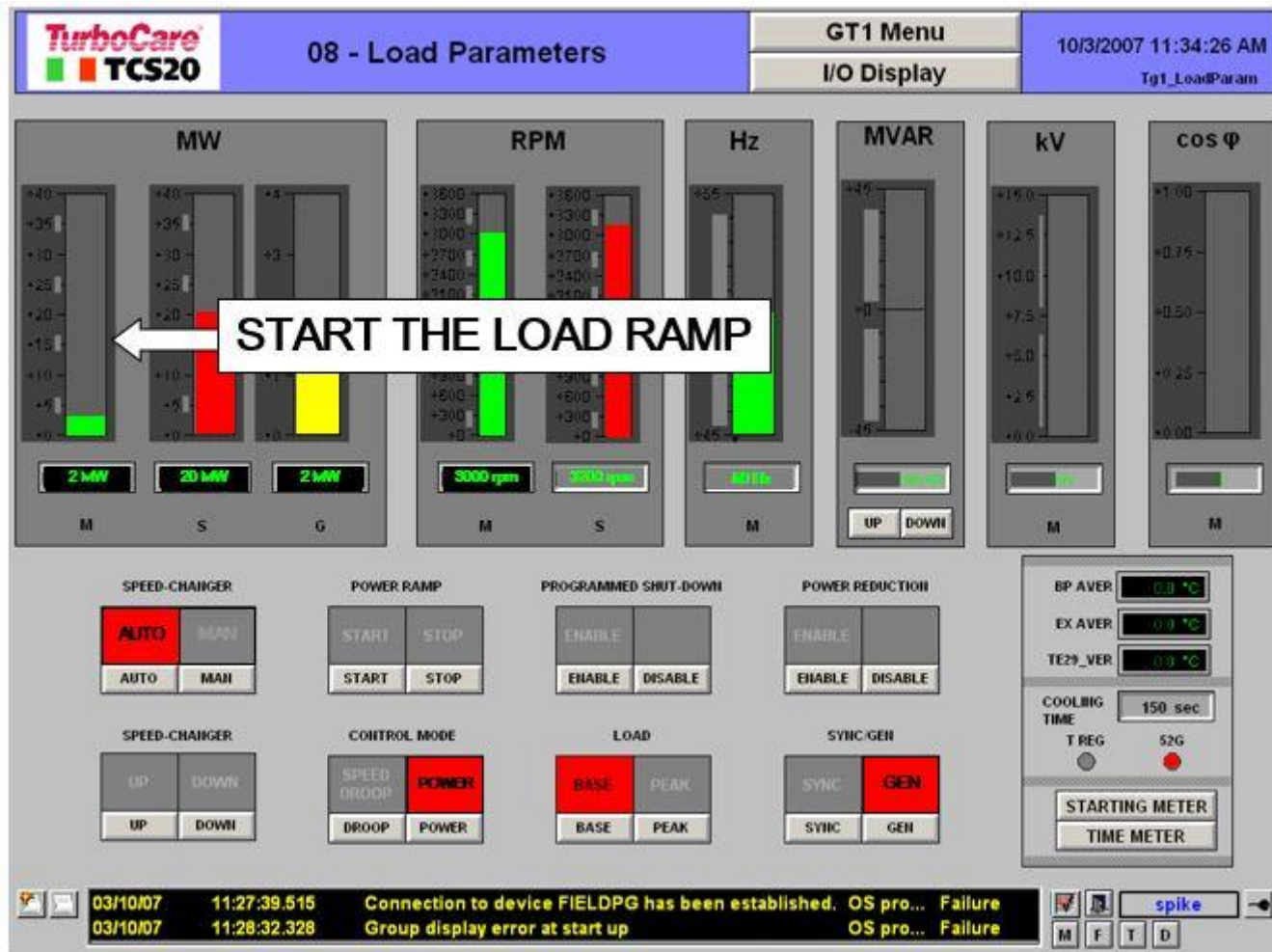


بداية إستجابة التحميل حسب إعدادات التدرج في الحمل

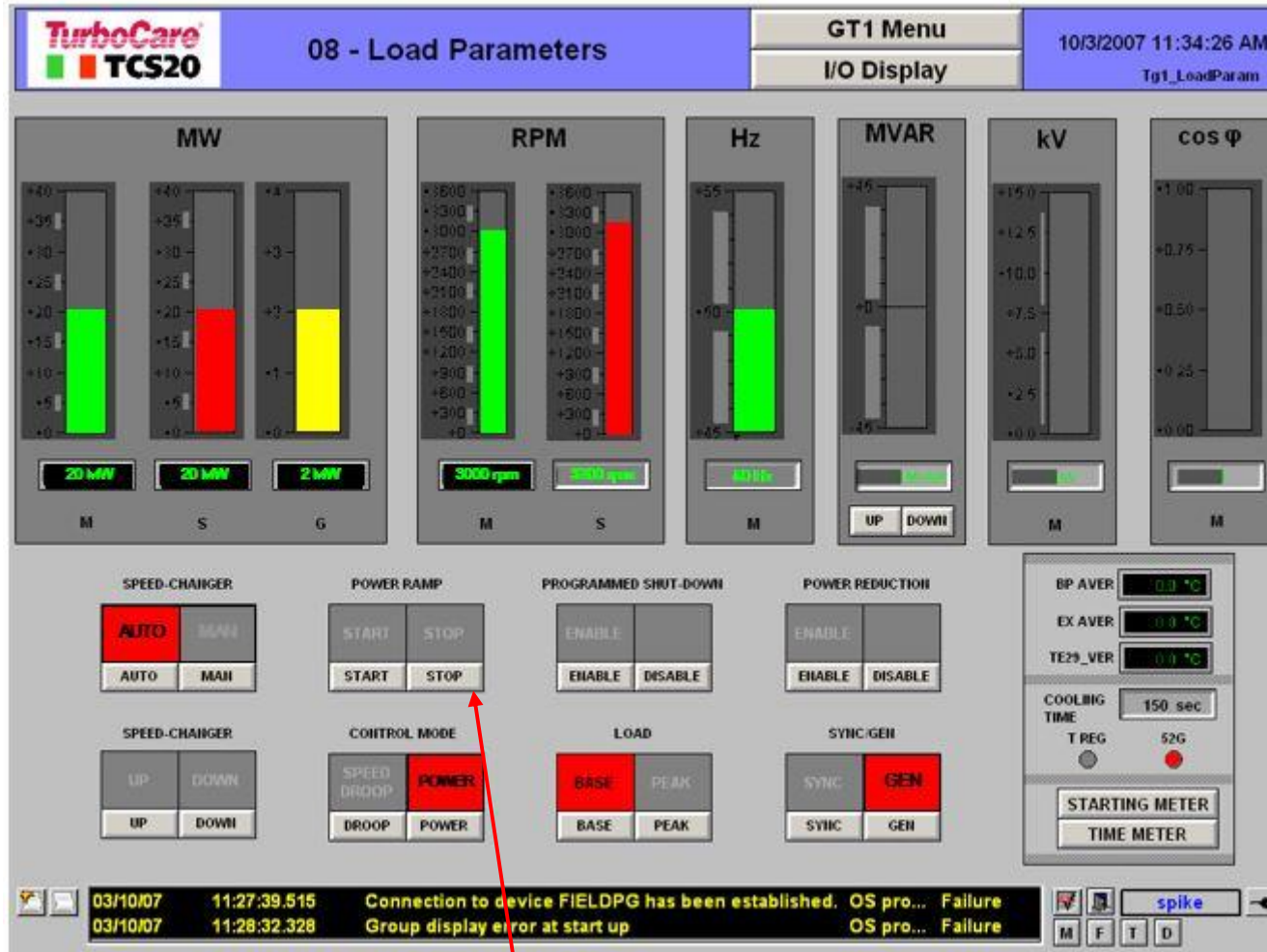


عندما تتم مزامنة التوربين الغازي GT (وبعد ٥ ثواني) ، يتحول نظام التحكم Control system تلقائيا من نمط أو وضع التحكم في تدني أو إنخفاض السرعة  
 SPEED DROOP CONTROL MODE إلى نمط التحكم في القدرة POWER CONTROL MODE

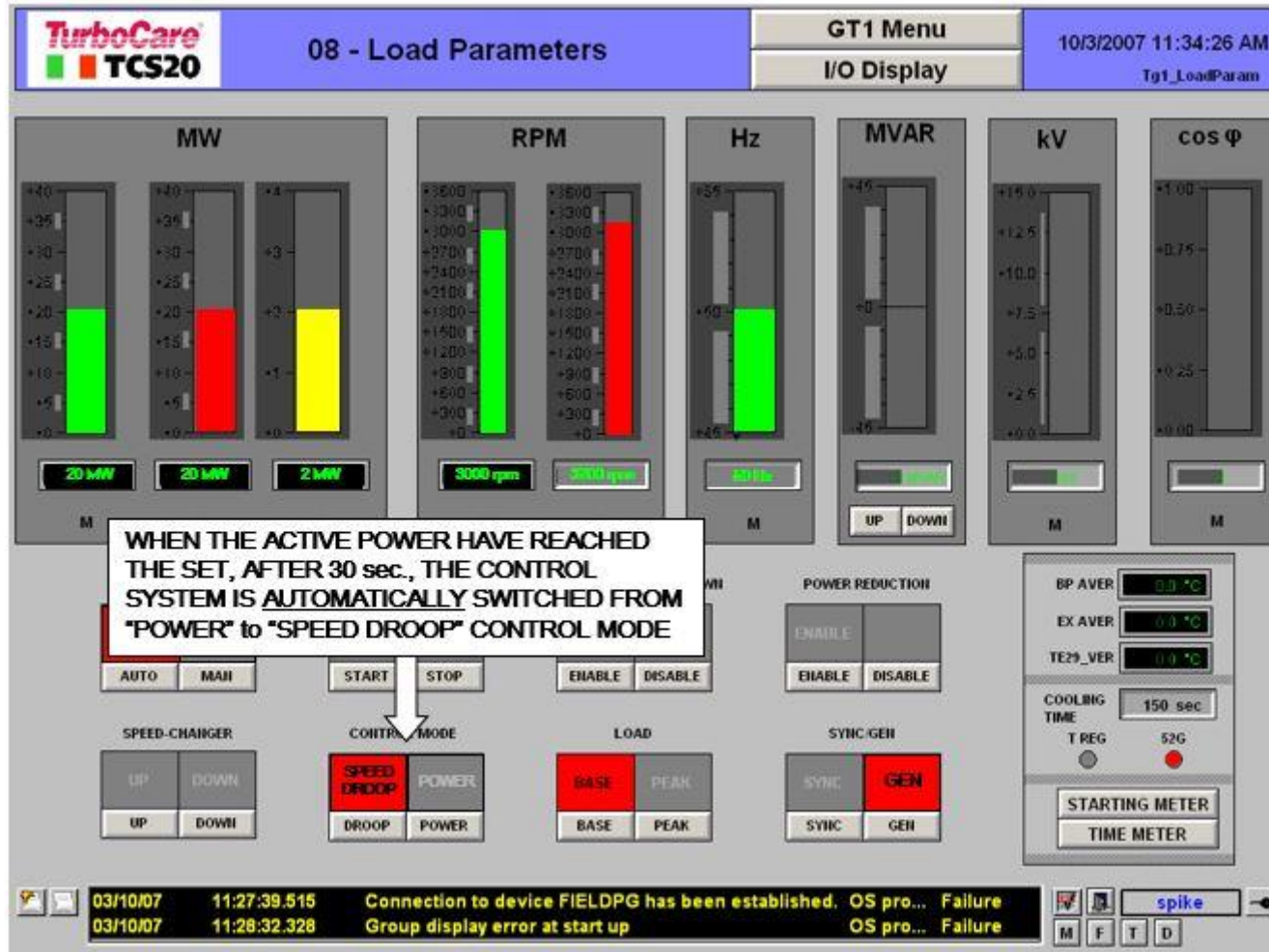




ويتم بدء صعود الحمل Load ramp حسب ضبط التدرج



- خلال هذه المرحلة ، من الممكن إيقاف صعود الحمل ، مع تحريك المؤشر إلى إشارة (صعود القدرة POWER RAMP) والضغط على أمر ( إيقاف STOP) .  
 وبتحريك المؤشر إلى إشارة (صعود القدرة POWER RAMP) والضغط على أمر ( بدء START) للبدء مرة أخرى بصعود الحمل Load ramp .  
 تزيد الماكينة من القدرة الفعالة Active power إلى أن تصل إلى القيمة المحددة Set value وهي ( ٢٠ ميكاواط) .



عند الوصول إلى القيمة المحددة ، (بعد ٣٠ ثانية) ، يتم تحول نظام التحكم Control system تلقائياً من نمط التحكم في القدرة POWER CONTROL MODE إلى نمط أو وضع التحكم في تدني أو إنخفاض السرعة SPEED DROOP CONTROL MODE

## تغيير أو تحويل الوقود : FUEL CHANGE – OVER

- وقود الغاز -> زيت الوقود FUEL GAS -> FUEL OIL
- زيت الوقود -> وقود الغاز FUEL OIL -> FUEL GAS

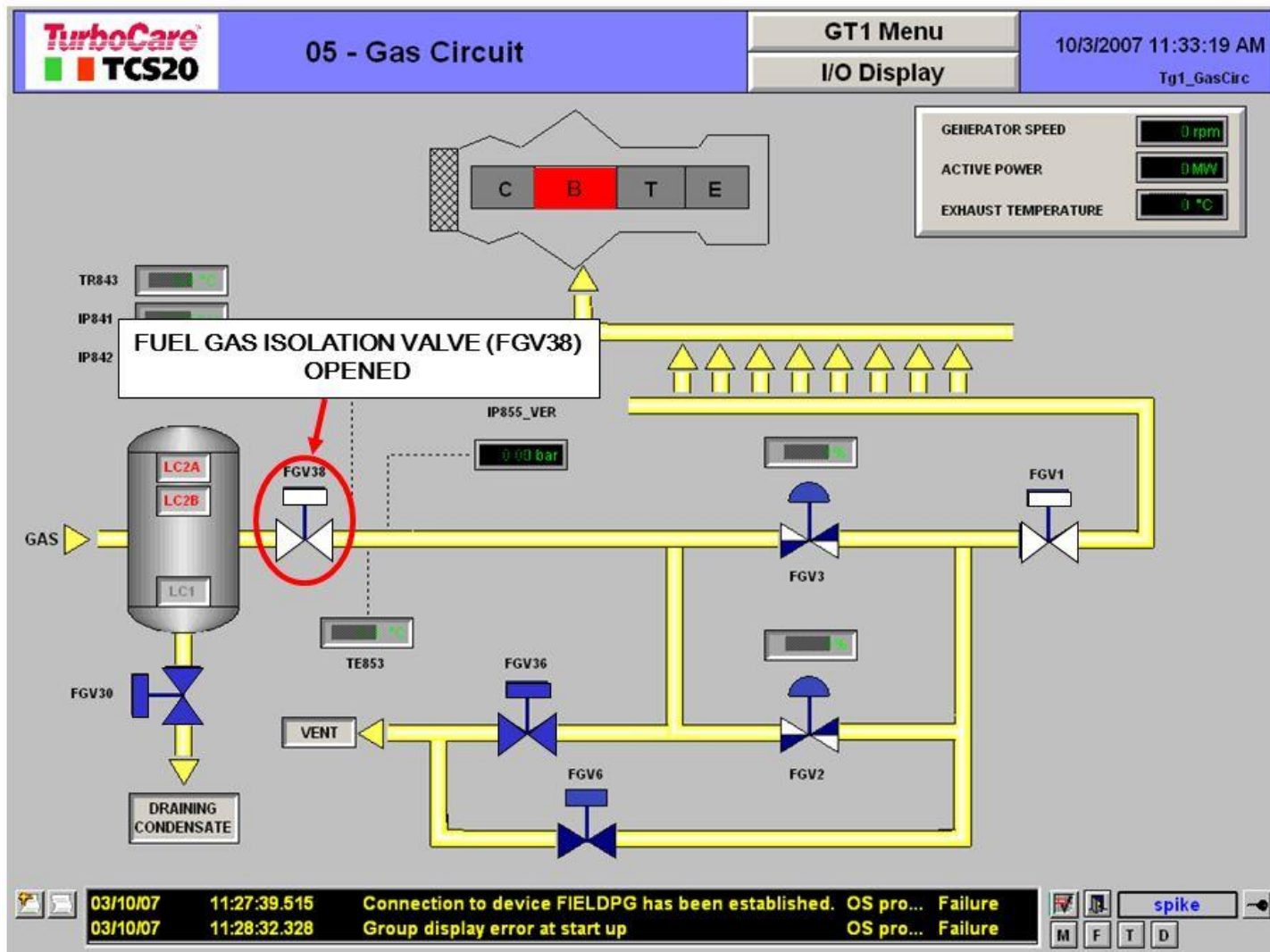
## تغيير أو تحويل وقود الغاز -> زيت الوقود : FUEL GAS -> FUEL OIL

- تغيير الوقود متاح فقط للتوربين الغازي ذو القدرة الفعالة Active Power < (١٠ ميكاواط) .
- تأكد من عدم وجود إشارات تحذيرية Alarms على دورة زيت الوقود Fuel oil circuit .
- تحقق من أن مؤشر تغيير الوقود FUEL CHANGE-OVER موجود على الوضع الذاتي AUTO .

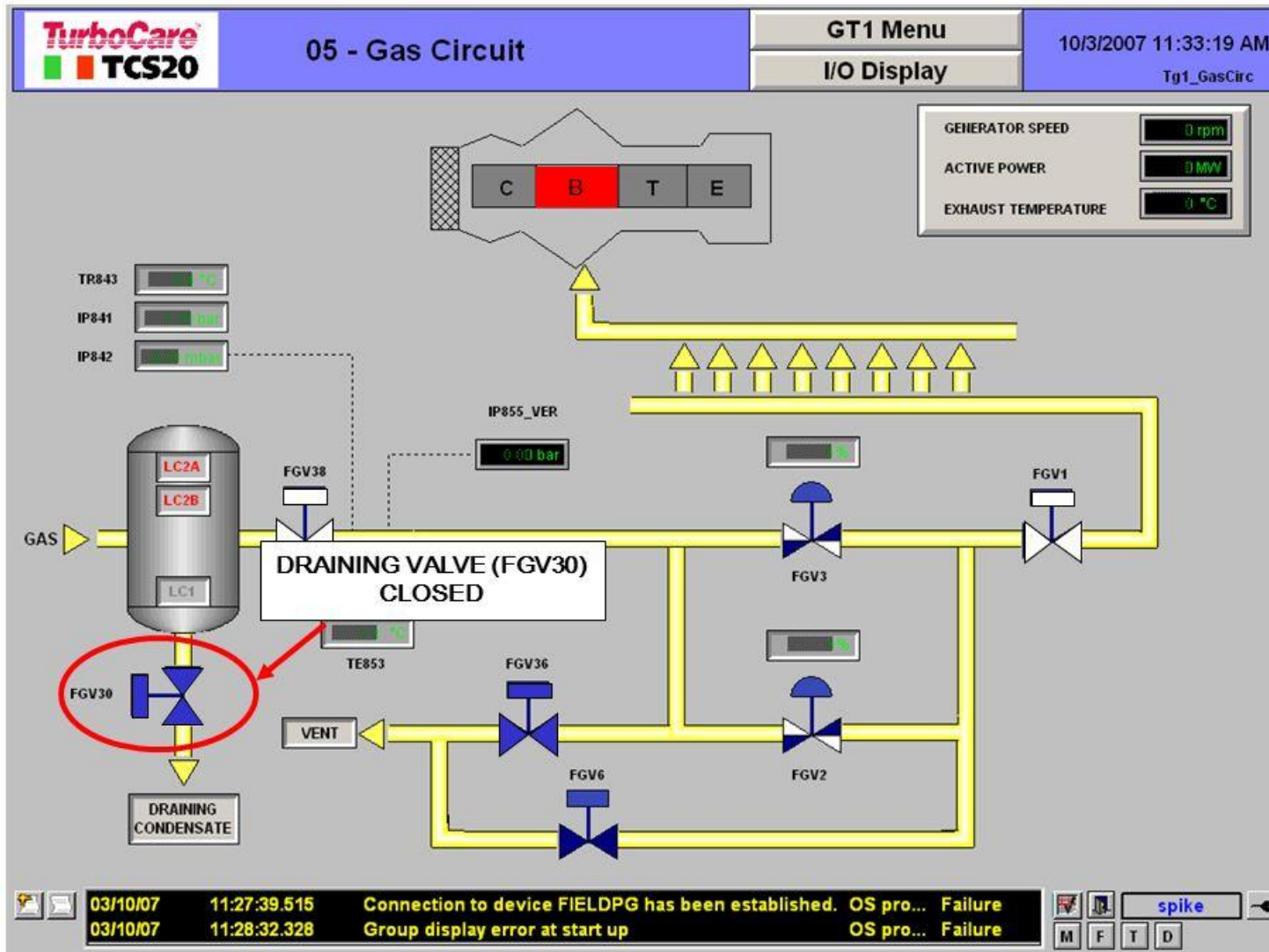
## تغيير أو تحويل وقود الغاز -> زيت الوقود (تابع) : FUEL GAS -> OIL CHANGE-OVER ( continue)

الشروط الأولية (التحضيرية) لدورة وقود الغاز : PRELIMINARY CONDITION FOR FUEL GAS CIRCUIT

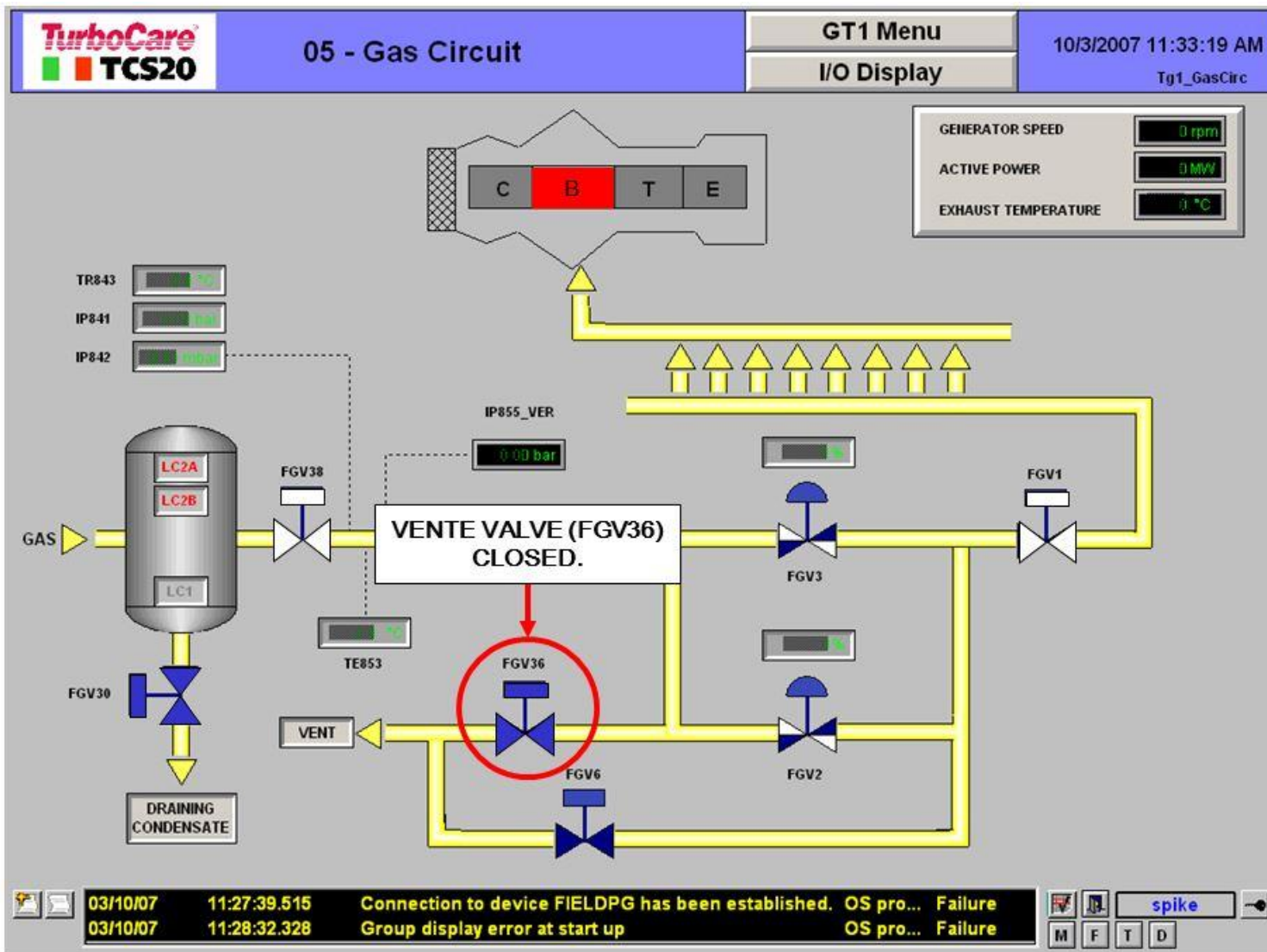




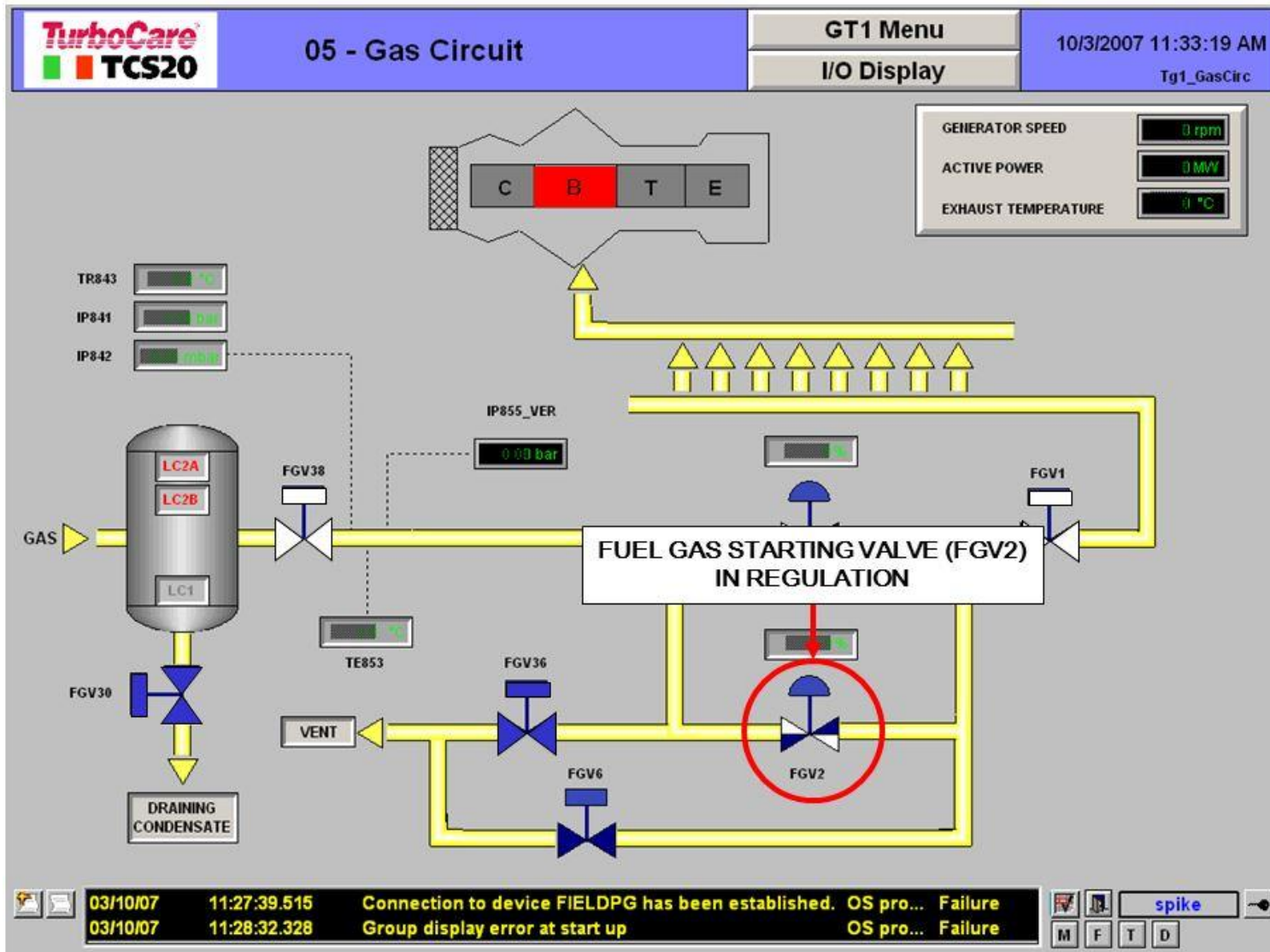
يتم فتح صمام عزل وقود الغاز (FGV38) Fuel gas isolation valve



يتم غلق صمام تصريف وقود الغاز المتكثف (FGV30) Fuel draining gas condensate valve

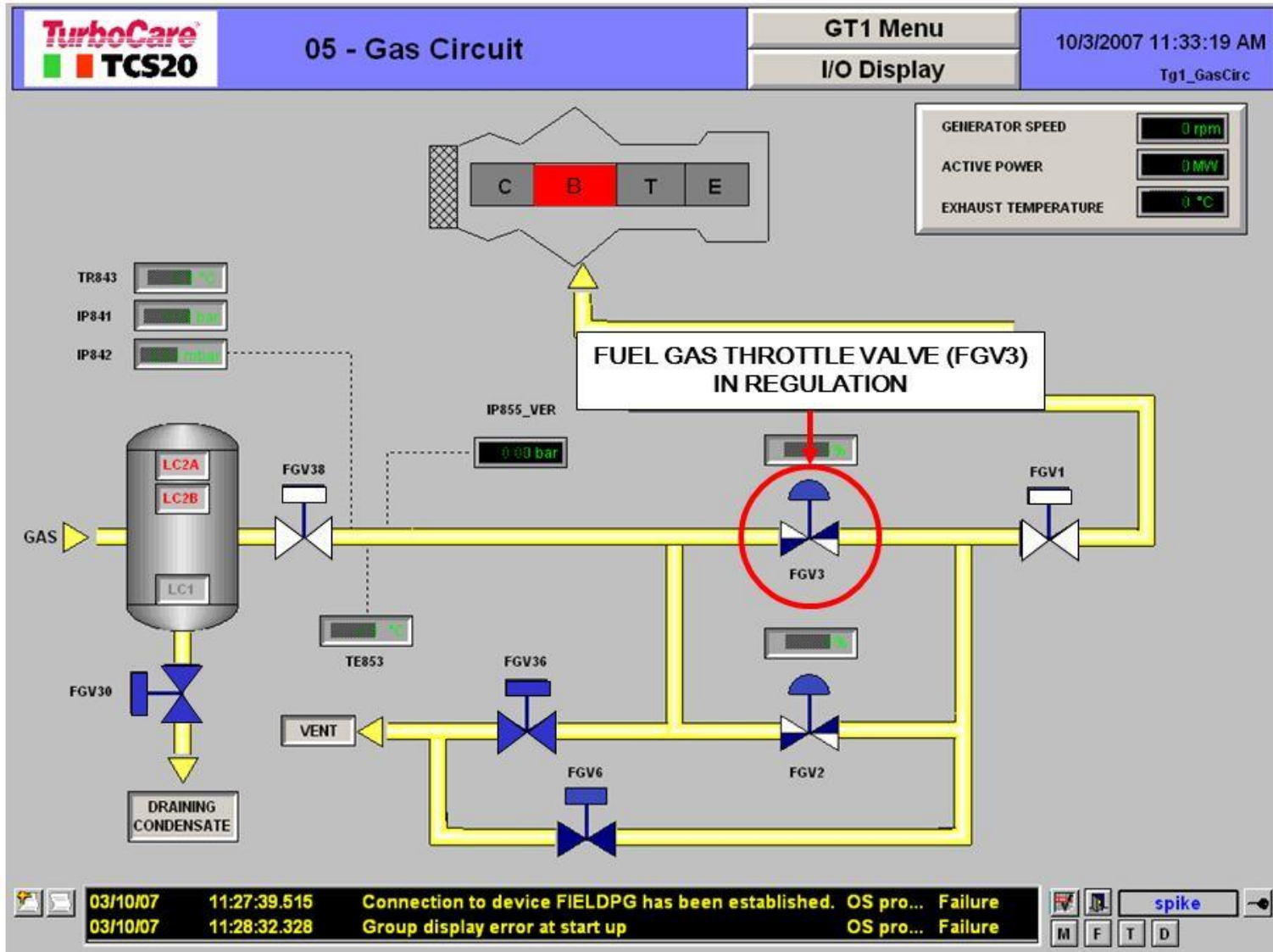


يتم غلق صمام تنفيس وقود الغاز (FGV36) Fuel gas vent valve

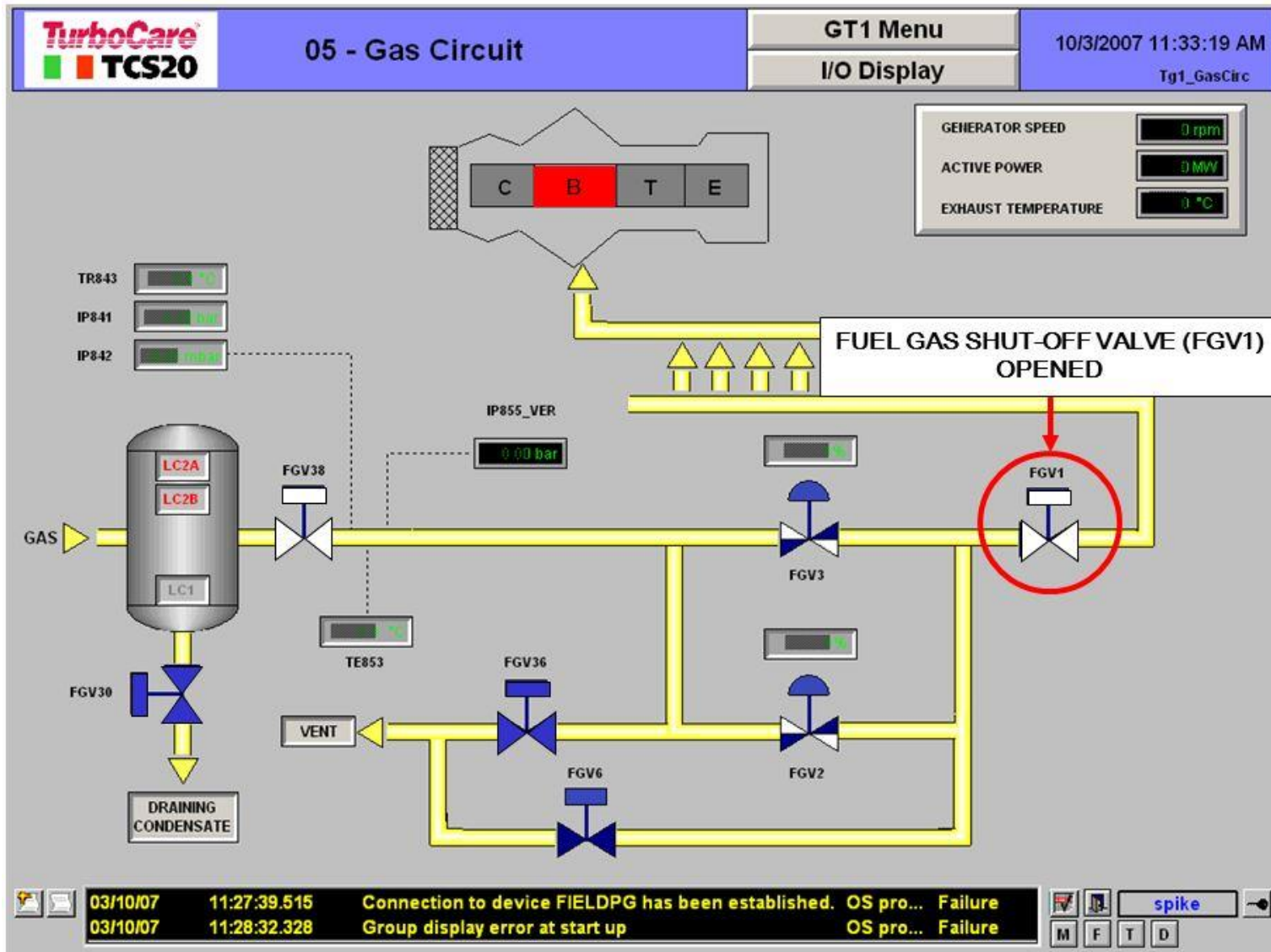


يتم تنظيم صمام بدء تشغيل وقود الغاز (FGV2) Fuel gas starting valve



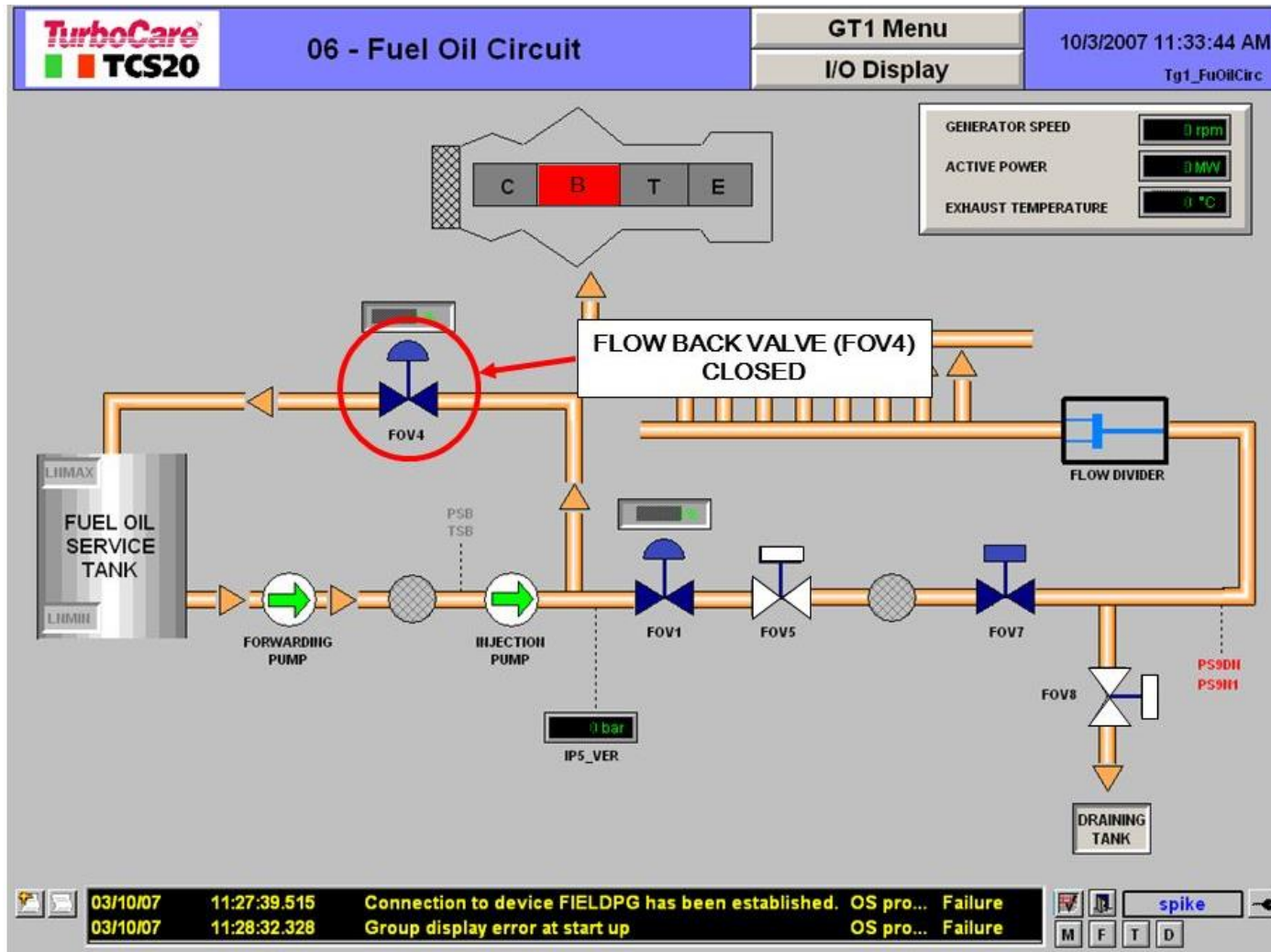


يتم تنظيم صمام خنق وقود الغاز (FGV3) Fuel gas throttle valve

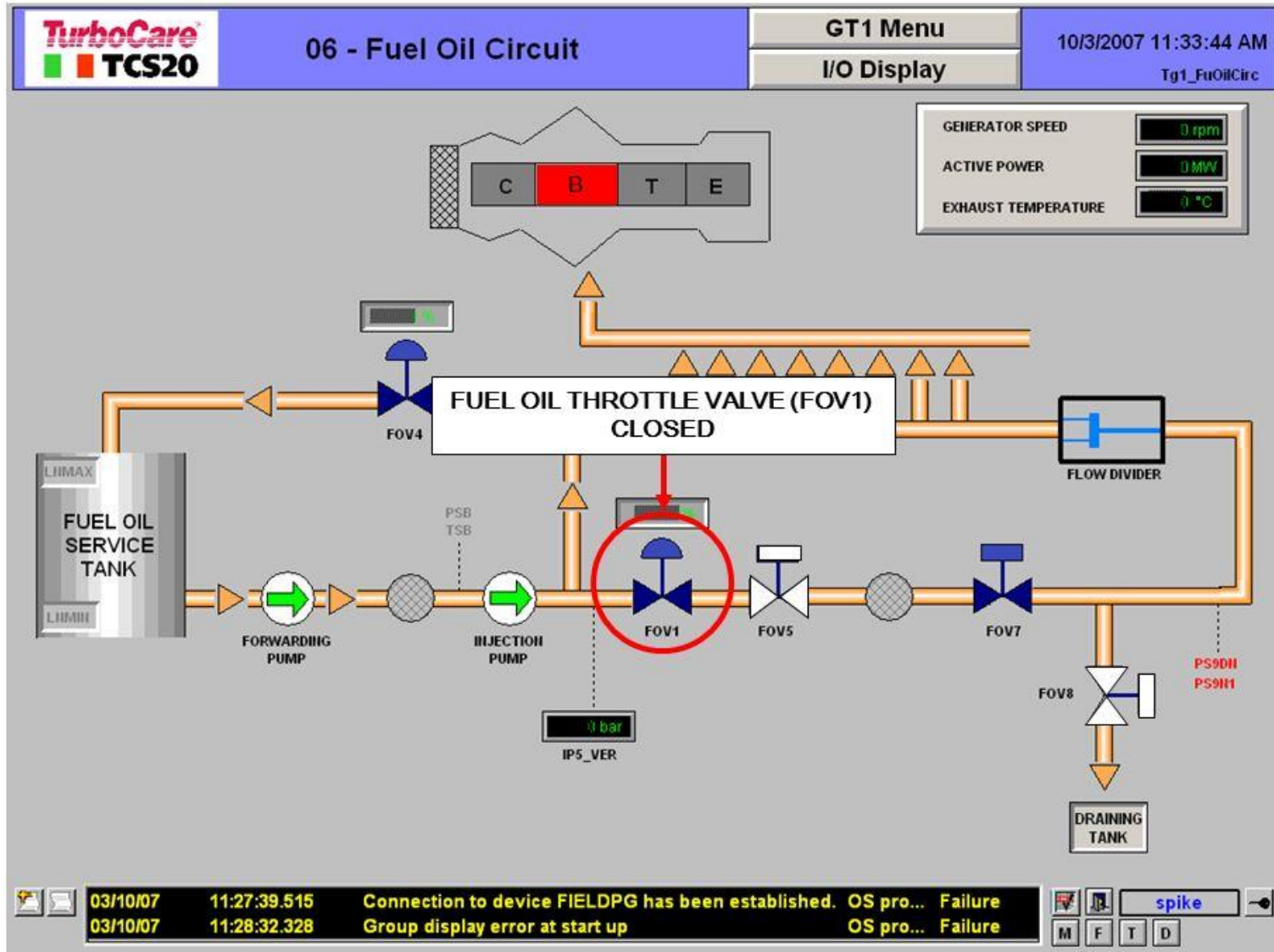


يتم فتح صمام إيقاف أو قطع وقود الغاز (FGV1) Fuel gas shut-off valve

الشروط الأولية (التحضيرية) لدورة زيت الوقود : PRELIMINARY CONDITION FOR FUEL OIL CIRCUIT

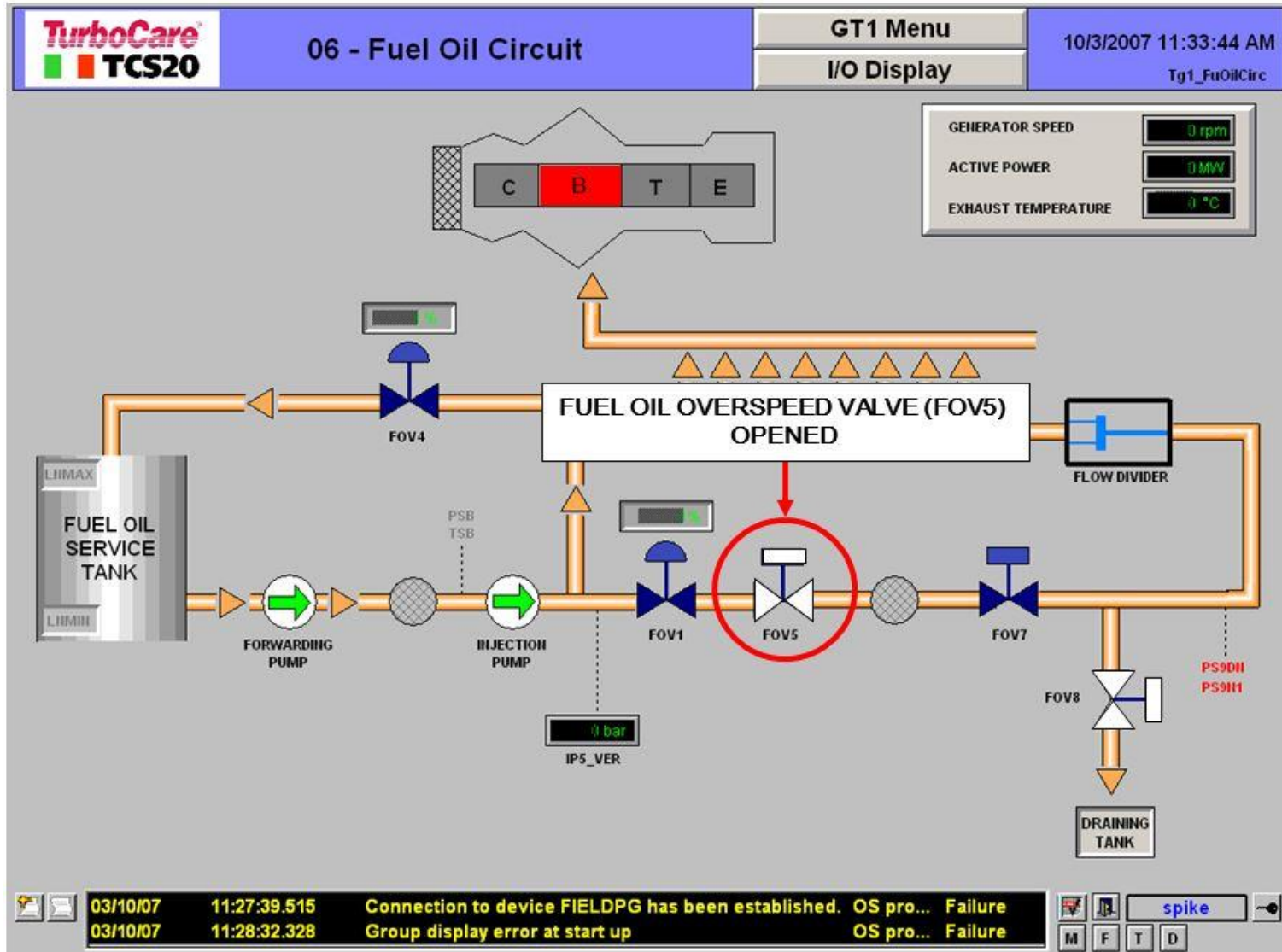


يتم غلق صمام التدفق الراجع لزيت الوقود (FOV4) Fuel oil flow back valve

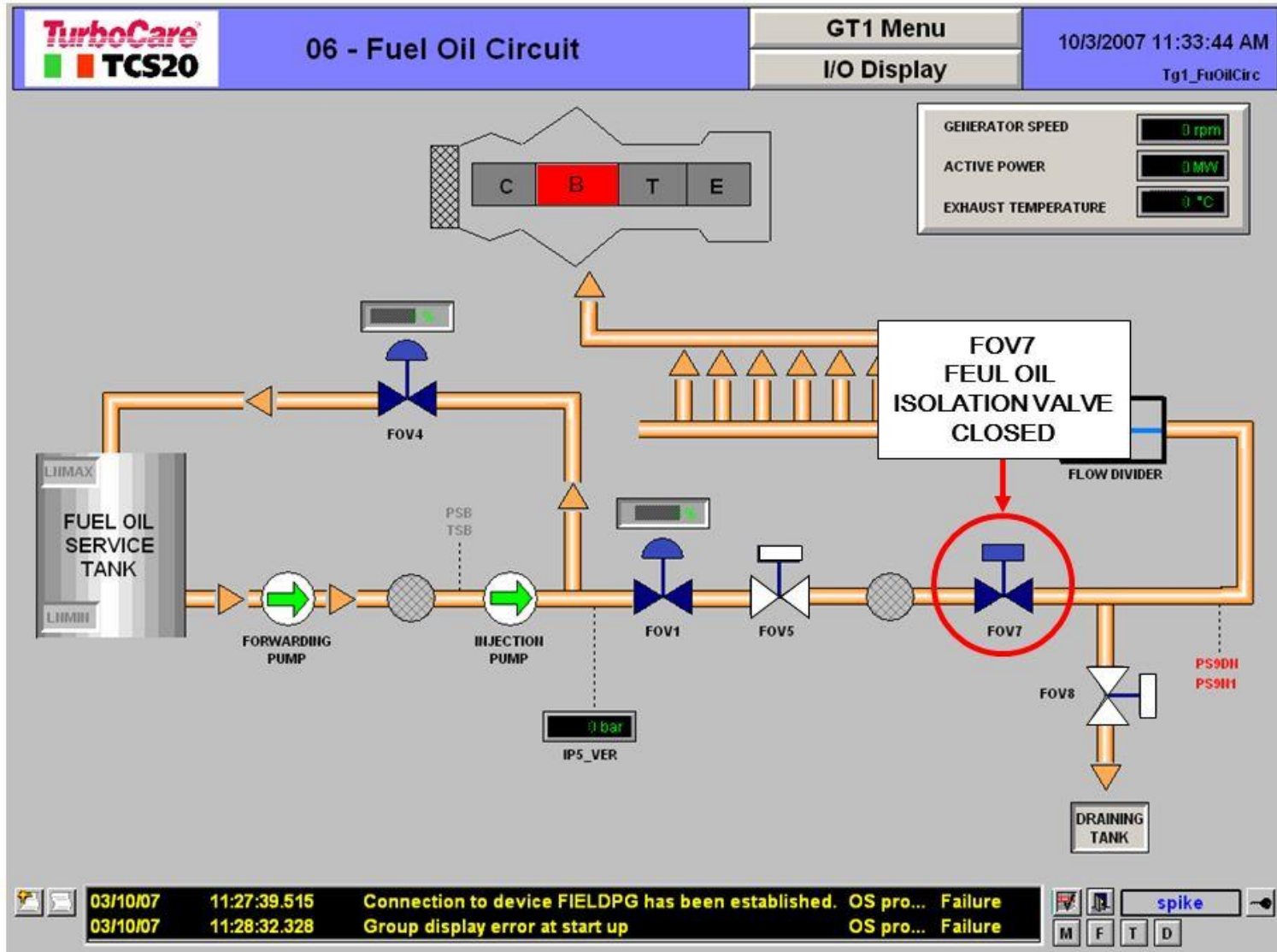


يتم غلق صمام خنق زيت الوقود (FOV1) Fuel oil throttle valve

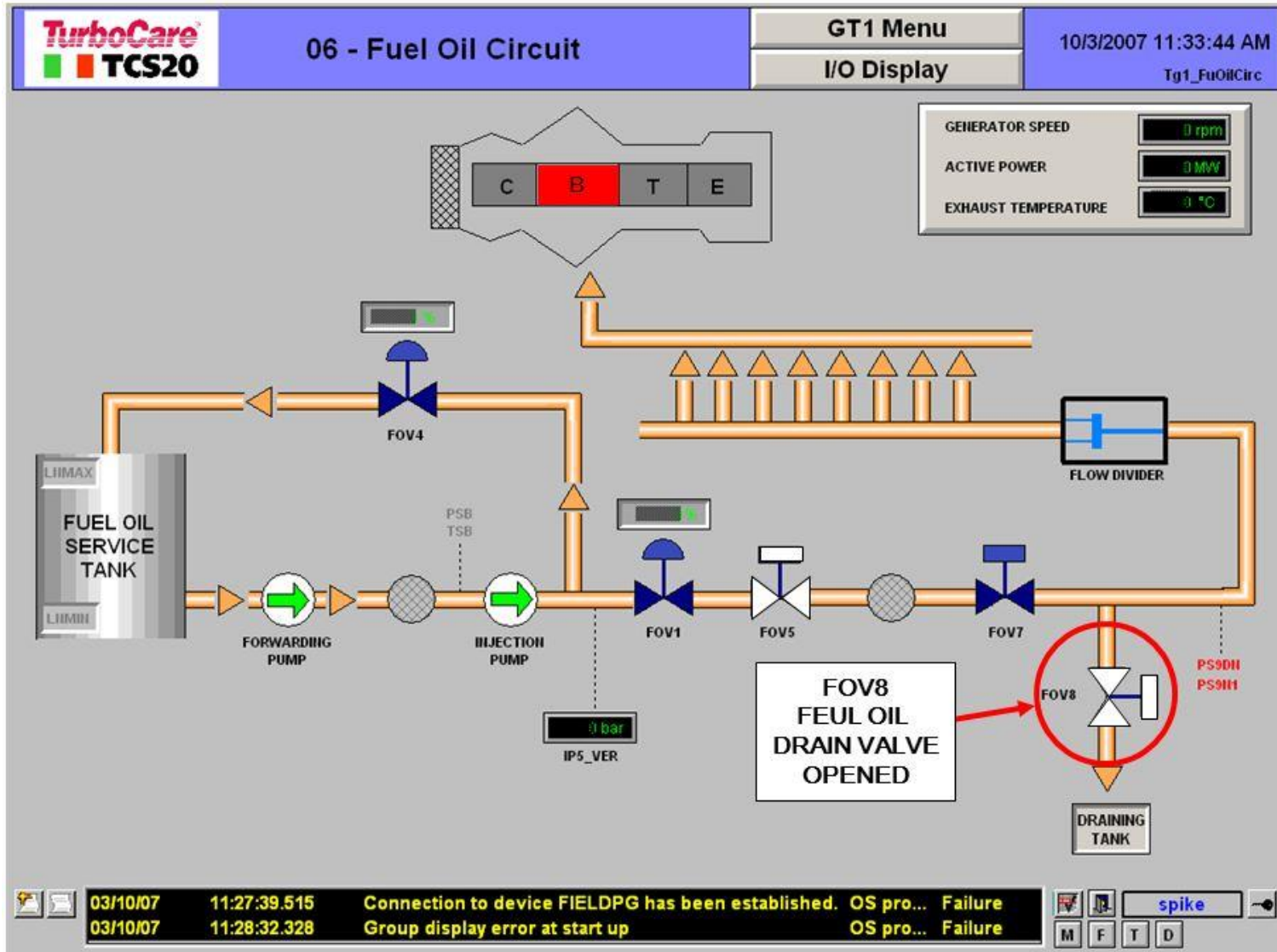




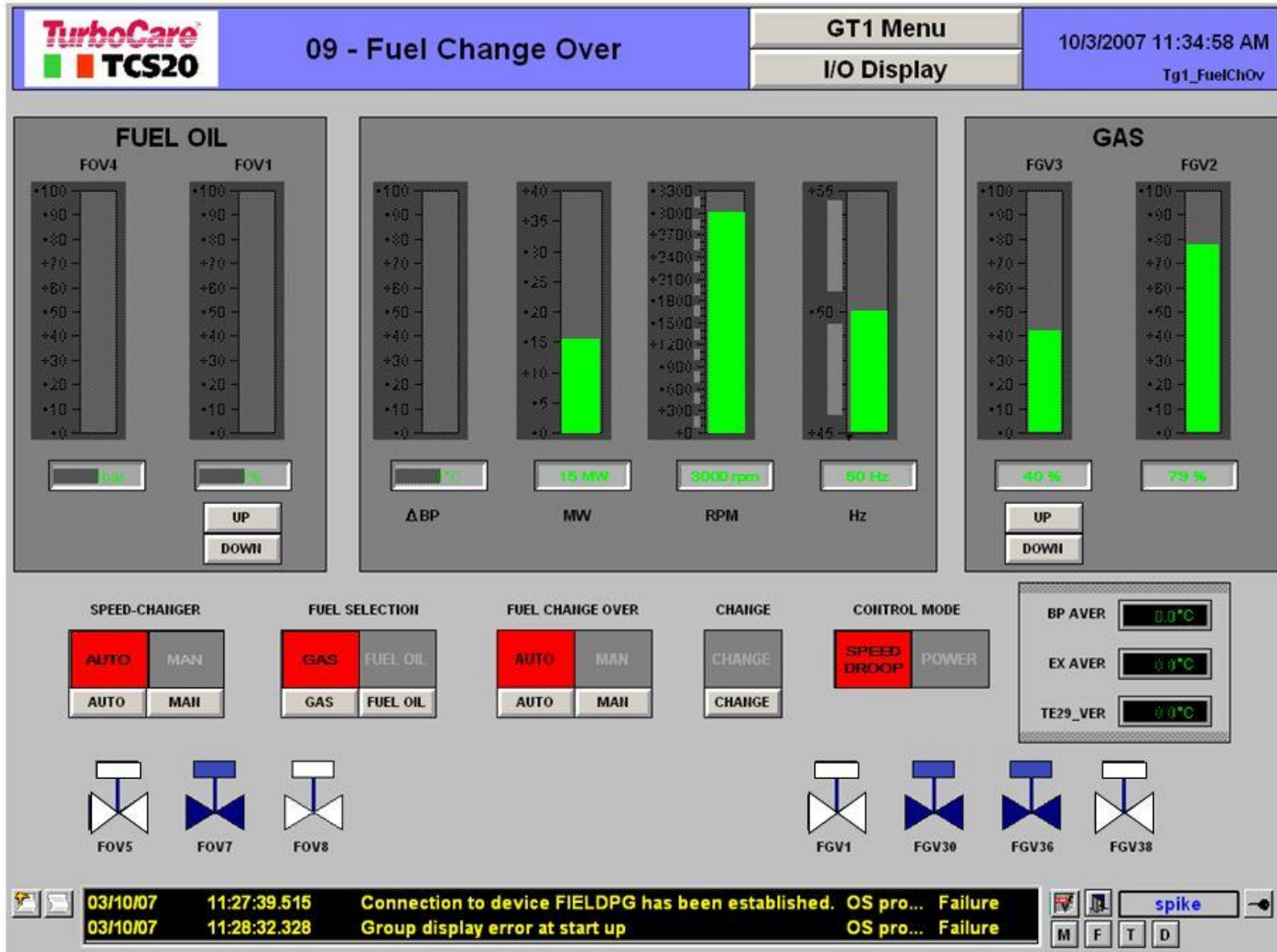
يتم فتح صمام السرعة الزائدة (تجاوز السرعة للتوربين) (FOV5) Overspeed valve



يتم غلق صمام عزل زيت الوقود (FOV7) Fuel oil isolation valve

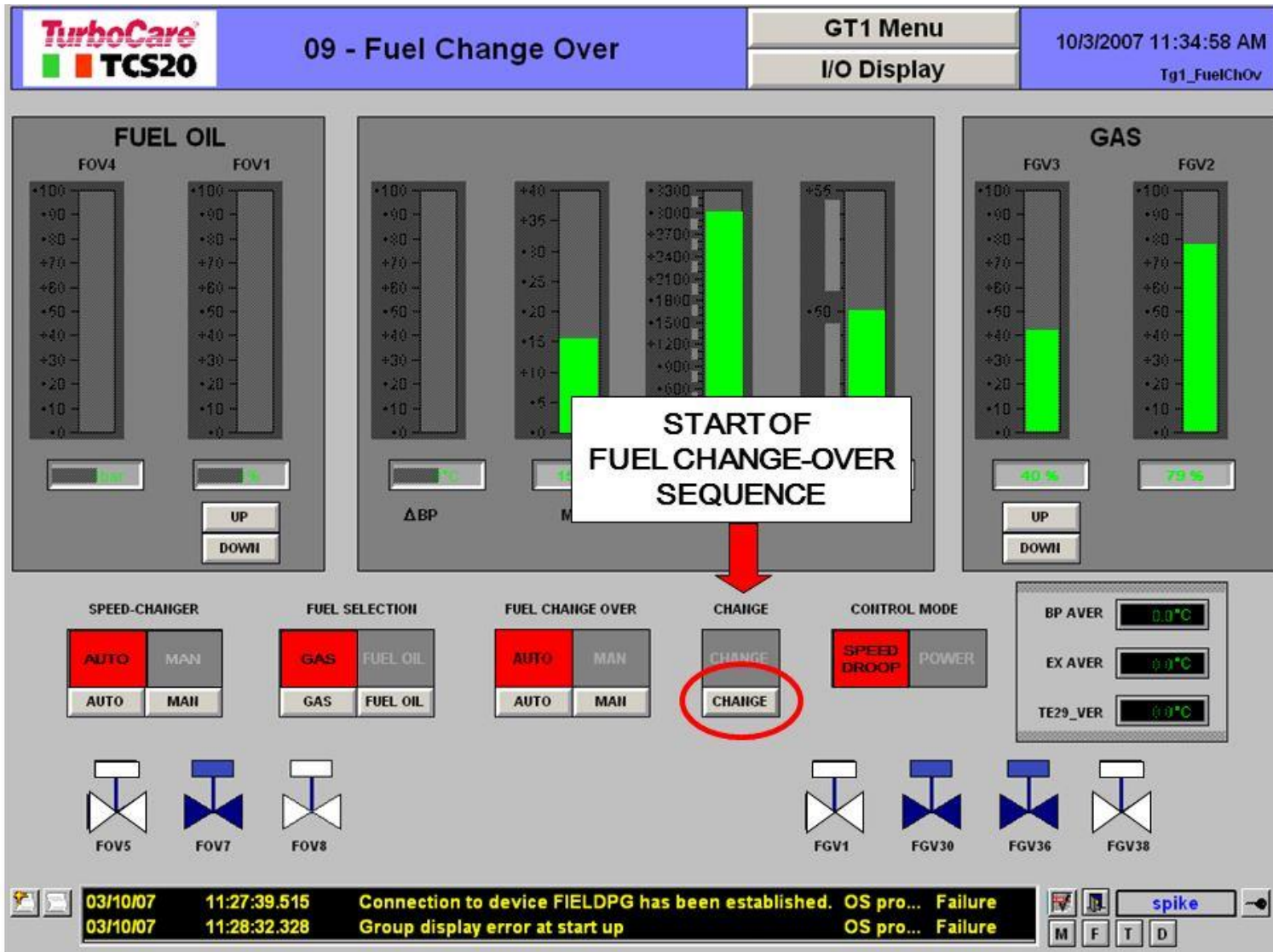


يتم غلق صمام تصريف جامع (مُجمَع) زيت الوقود (FOV8) Fuel oil collector drainage valve

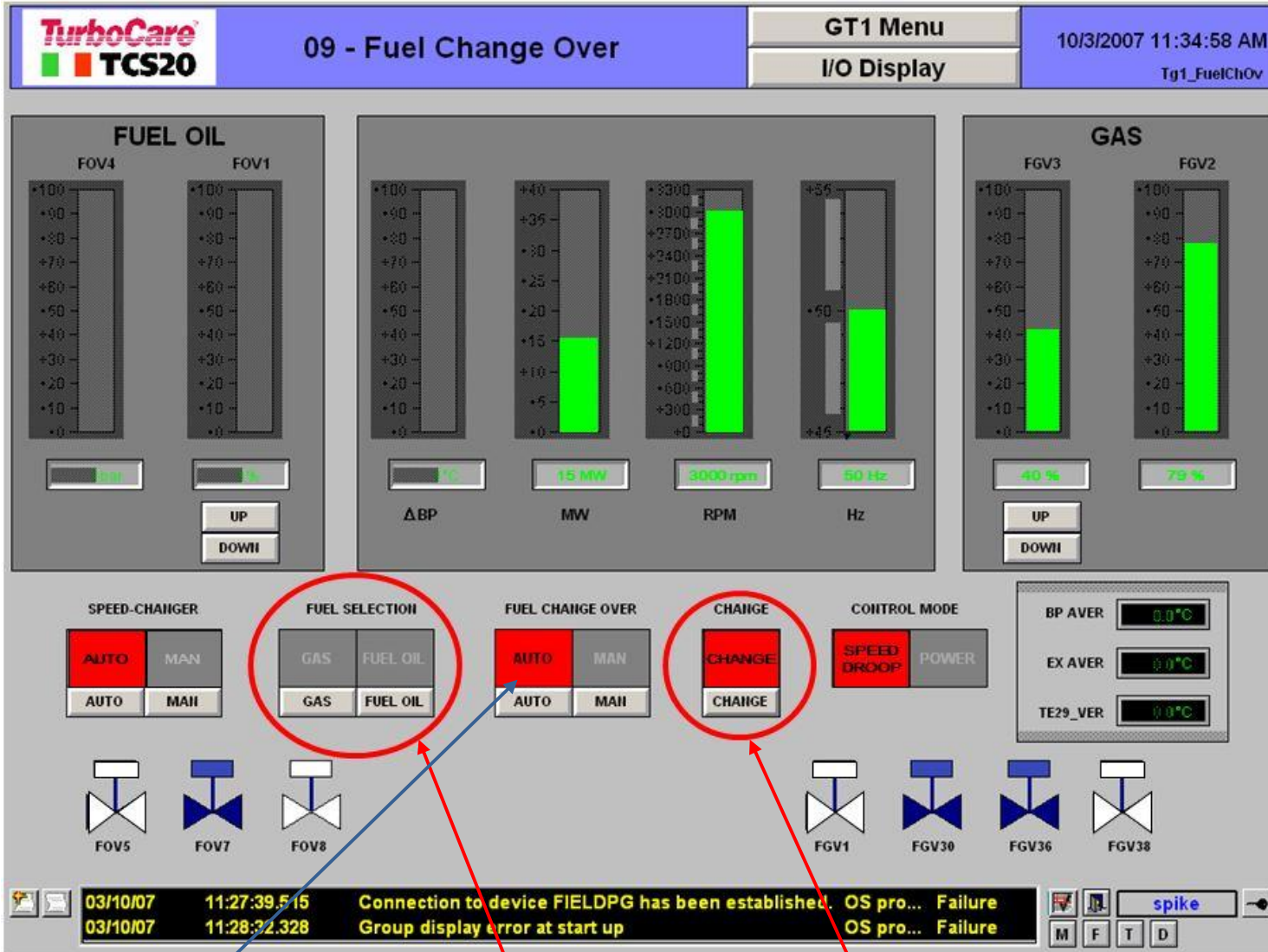


الصفحة الرئيسية لتغيير أو تحويل الوقود Fuel Change Over

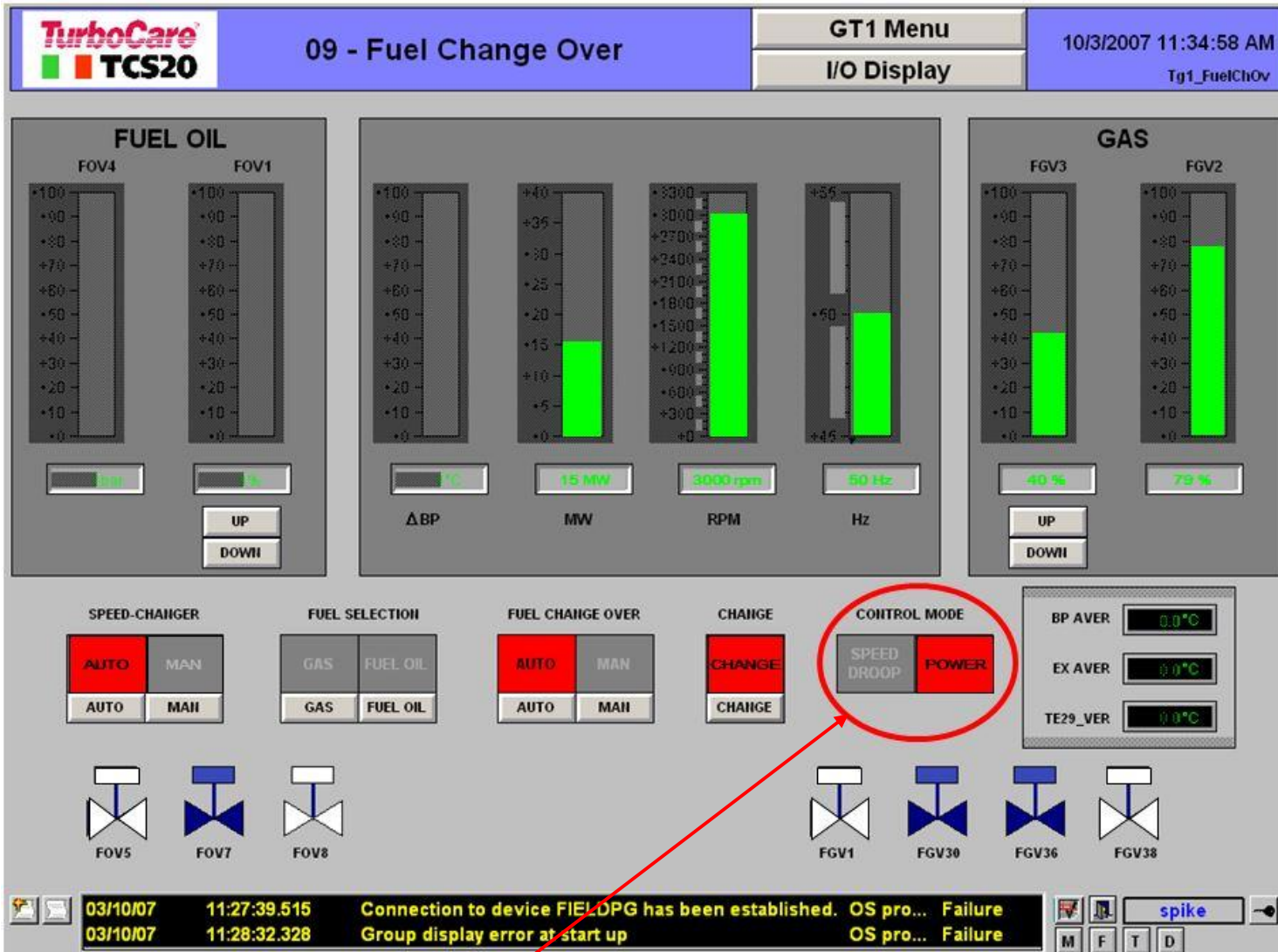




بدء تسلسل خطوات تحويل الوقود START OF FUEL CHANGE-OVER SEQUENCE

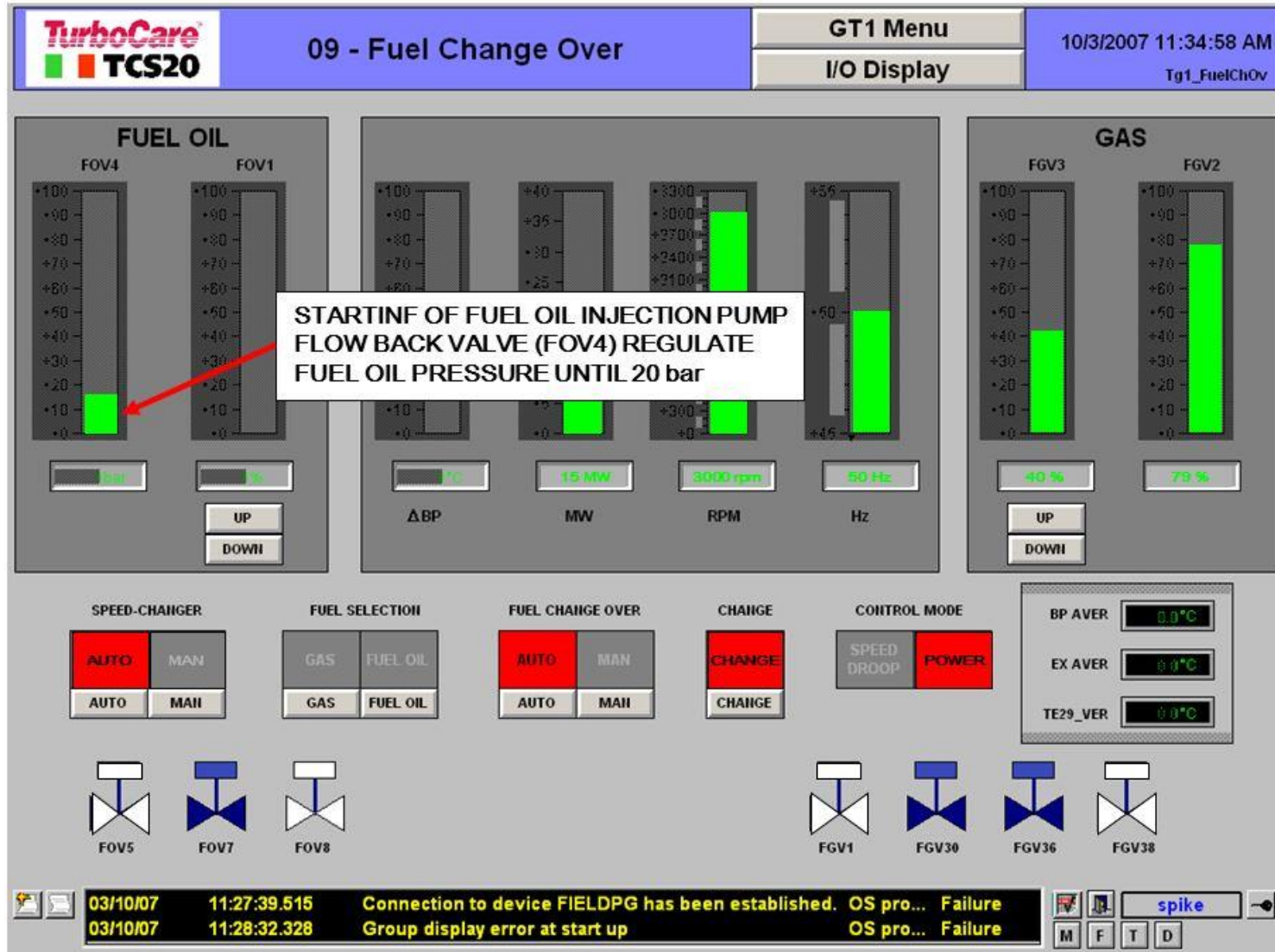


تحريك المؤشر إلى إشارة تغيير (CHANGE) ، إلغاء إختيار وقود الغاز وتفعيل التغيير CHANGE ، تحقق من أن مؤشر تغيير الوقود ( FULE CHANGE-OVER ) مُحدد على الوضع الذاتي AUTO



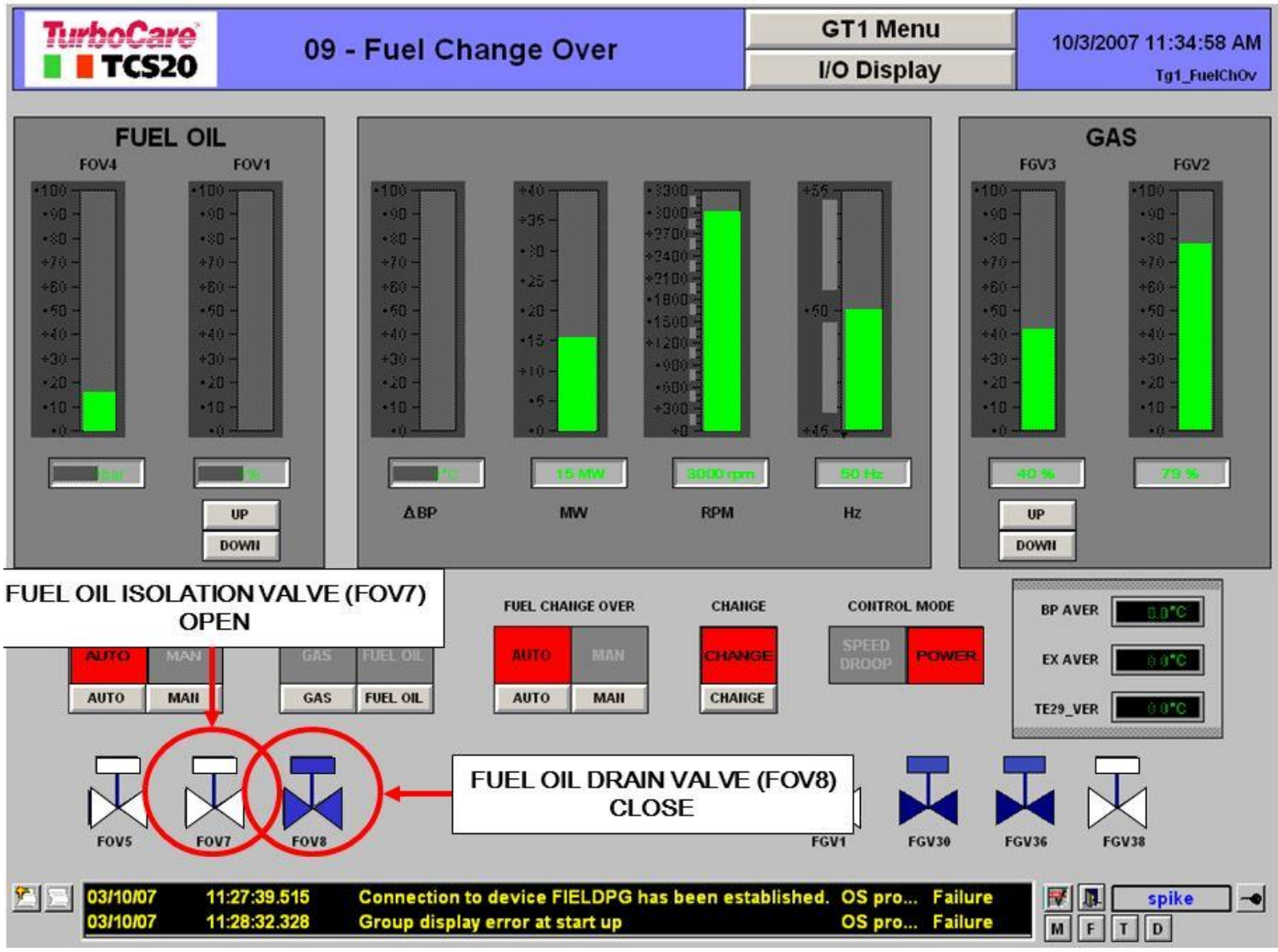
يتم تحويل وضع التحكم CONTROL MODE من نمط أو وضع التحكم في تدني أو إنخفاض السرعة SPEED DROOP إلى نمط التحكم في القدرة POWER



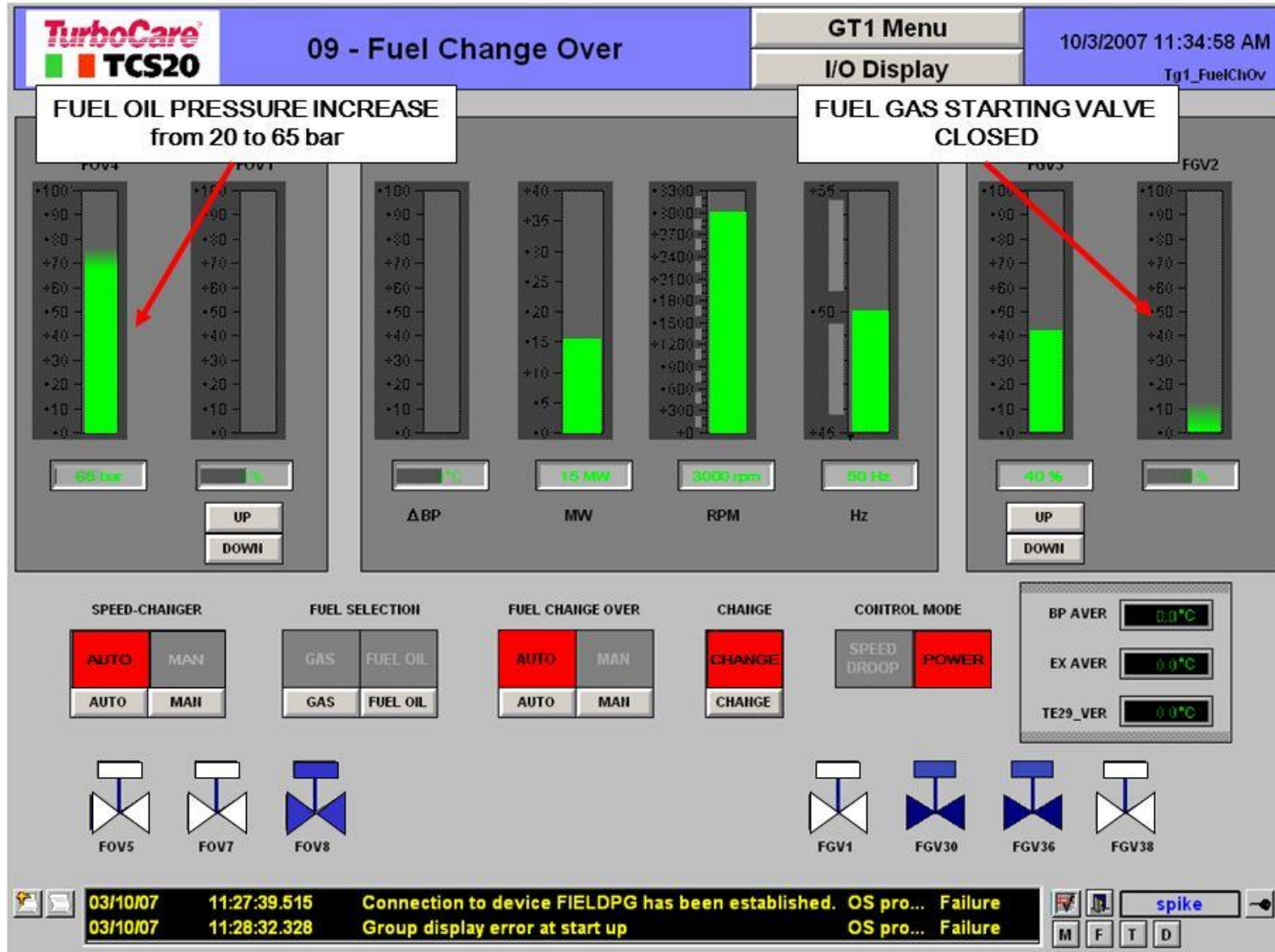


- بدء تشغيل مضخة حقن زيت الوقود Fuel oil injection pump
- بدء صمام التدفق الراجع لزيت الوقود (FOV4) Fuel oil flow back valve بتنظيم ضغط زيت الوقود حتى (٢٠ بار)

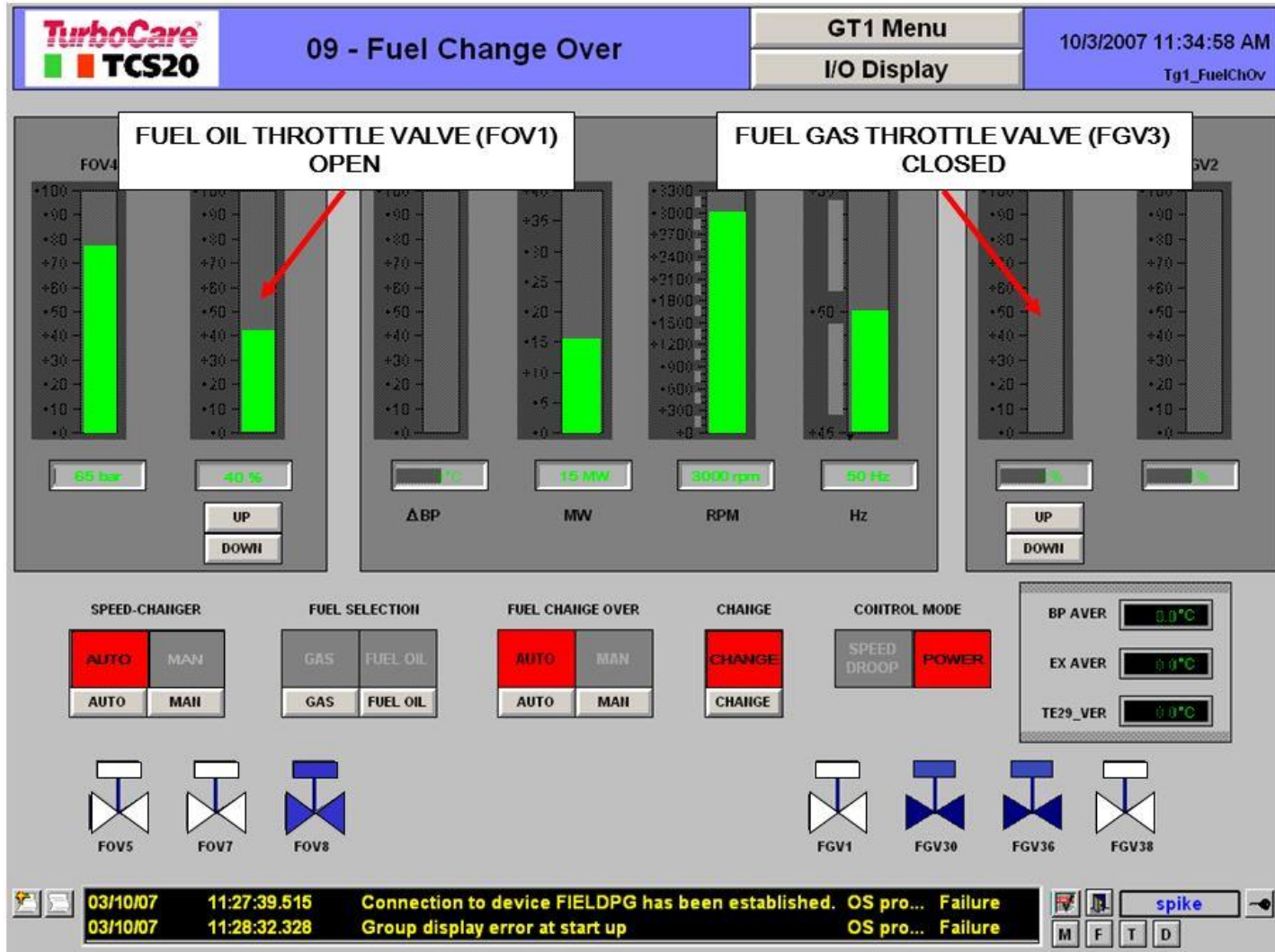




يتم فتح صمام عزل زيت الوقود FUEL OIL ISOLATION VALVE (FOV7) ، ويتم غلق صمام تصريف جامع (مُجمَع) زيت الوقود Fuel oil collector drainage valve (FOV8)

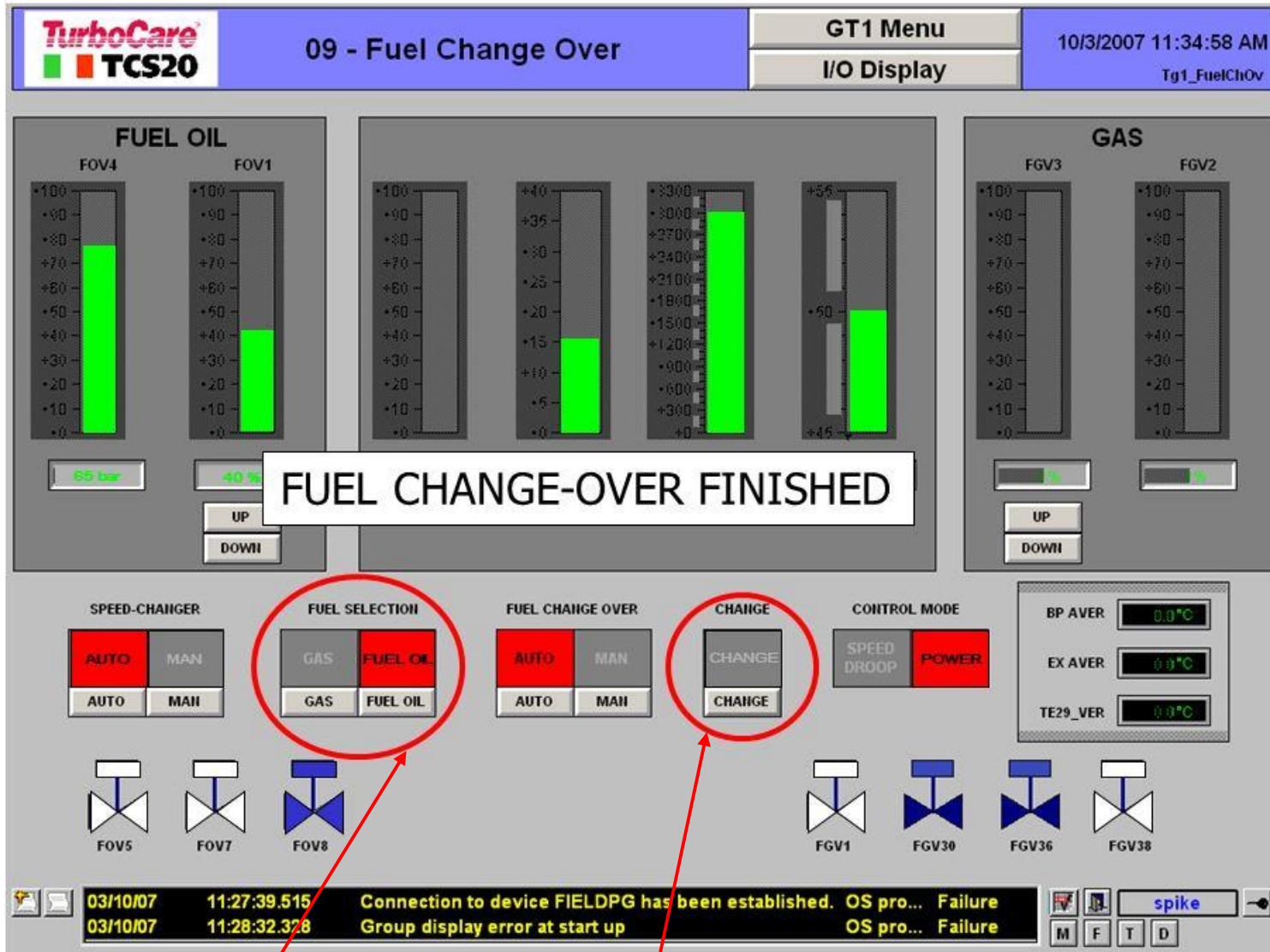


يزداد ضغط زيت الوقود fuel oil pressure لصمام التدفق الراجع Fuel oil flow back valve FOV4 (من ٢٠ إلى ٦٥ بار) وفقاً لتدرج زمني Time ramp مُنظم مسبقاً ، وفي نفس الوقت يتم غلق صمام بدء تشغيل وقود الغاز Fuel gas starting valve (FGV2) وفقاً لمهمة أو وظيفة تدرج زمني مماثل



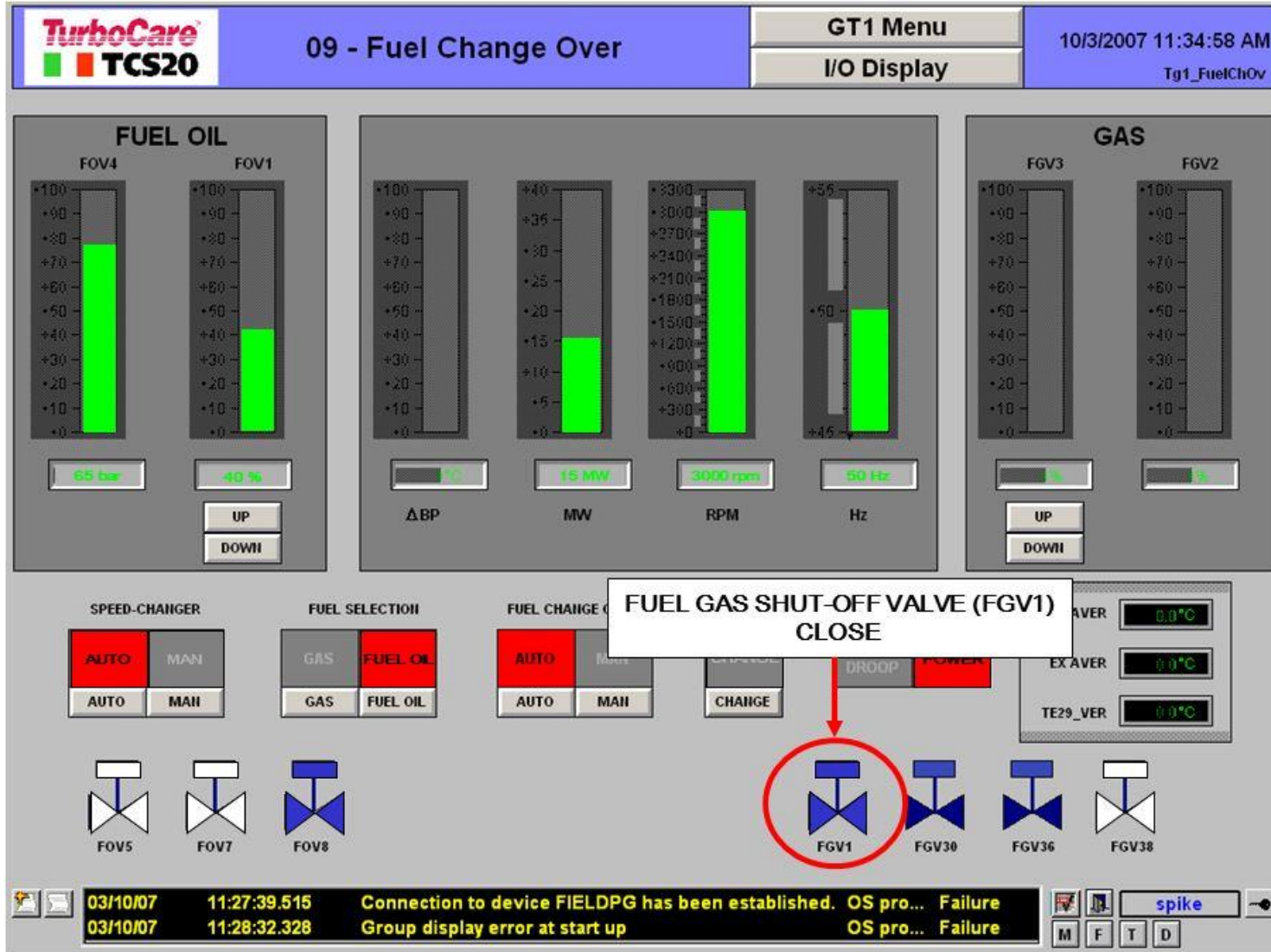
عندما يصل ضغط زيت الوقود إلى (٦٥ بار) ، يبدأ التغيير Change-over في صمامات الخنق Throttle valves . حيث يتم فتح صمام خنق زيت الوقود Fuel oil throttle valve FOV1 وفقا لمؤقت التغيير change-over timer (ضبط وبدء خطوة العداد للأعلى) ، وفي نفس الوقت يتم غلق صمام خنق وقود الغاز Fuel gas throttle valve FGV3 وفقا ، لمؤقت التغيير ( ضبط وبدء خطوة العداد للأسفل) ، حتى الوصول إلى أدنى قيمة



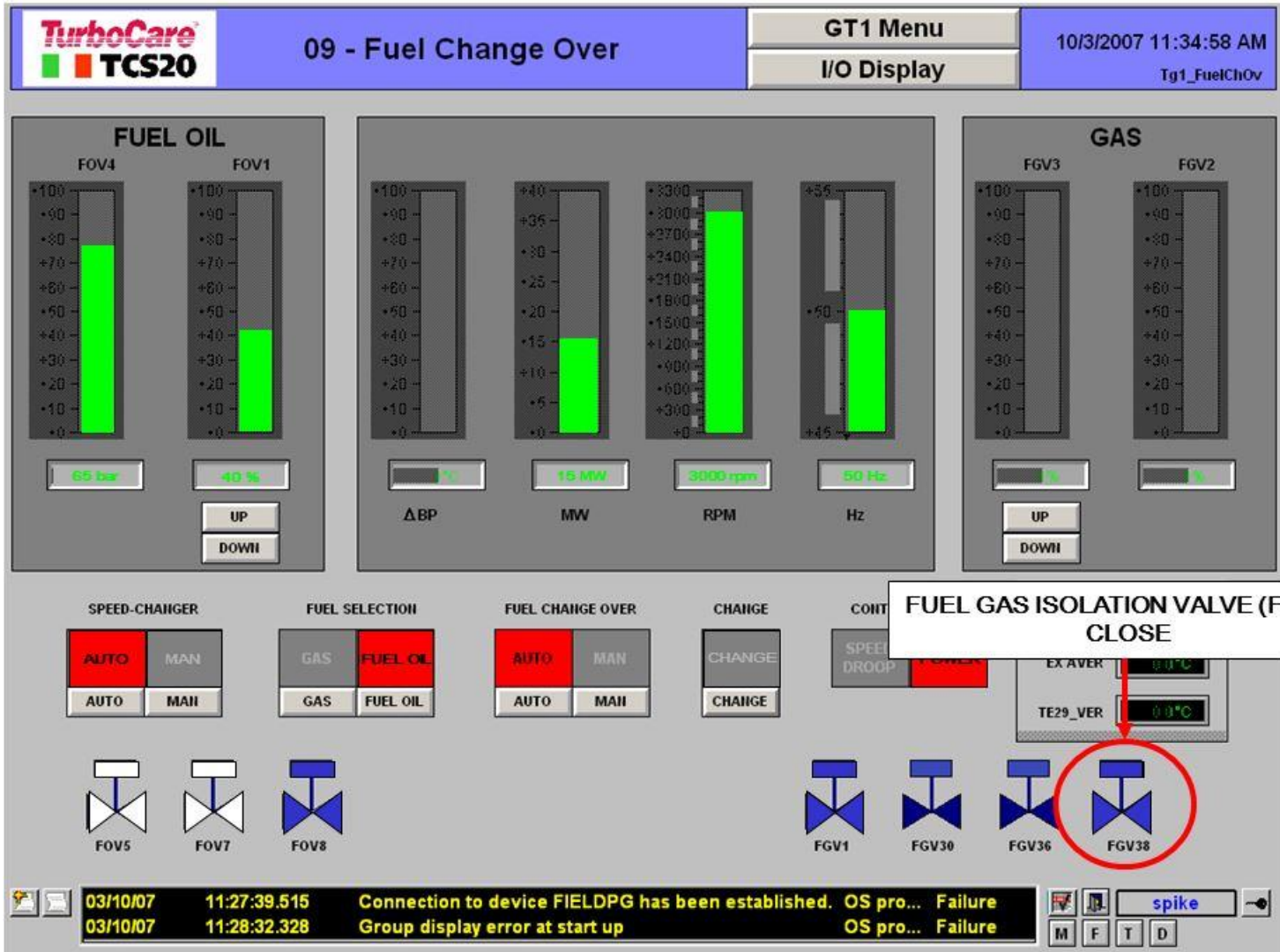


عندما يتم إغلاق صمام خنق وقود الغاز FGV3 ، وبعد ( ١٠ ثواني) ستنتهي عملية التغيير أو التحويل . يتم التعرف على حالة نهاية عملية تغيير أو تحويل الوقود Change-Over من خلال تغيير مؤشر إختيار الوقود (FUEL SELECTION) إلى التشغيل على زيت الوقود (FUEL OIL)

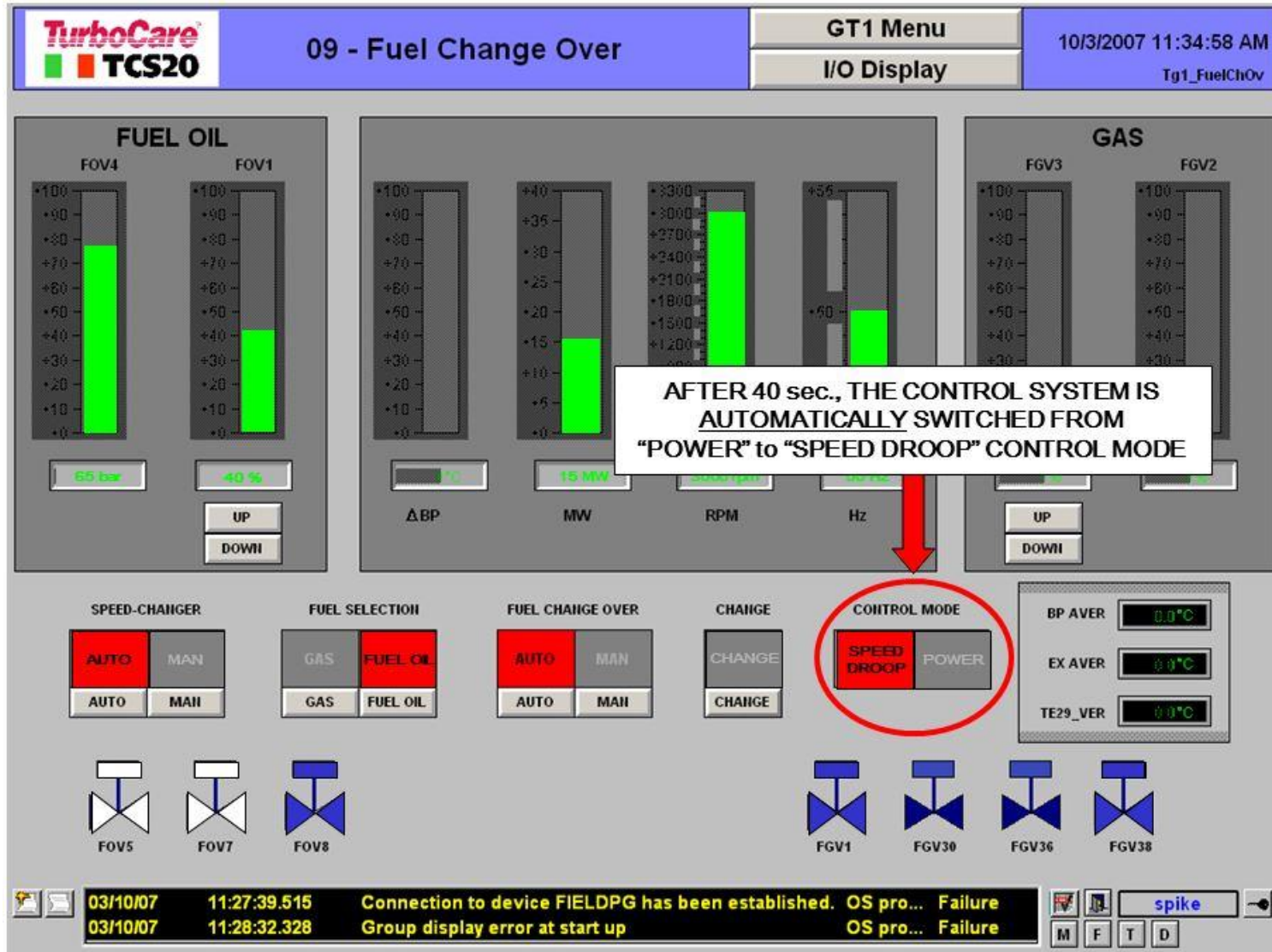




يتم غلق صمام إيقاف أو قطع وقود الغاز (FGV1) Fuel gas shut-off valve



يتم غلق صمام عزل وقود الغاز (FGV38) Fuel gas isolation valve (FGV38)



بعد حوالي (٤٠ ثانية) . يتم تحويل نظام التحكم تلقائياً من ( POWER CONTROL MODE ) إلى ( SPEED DROOP CONTROL MODE )

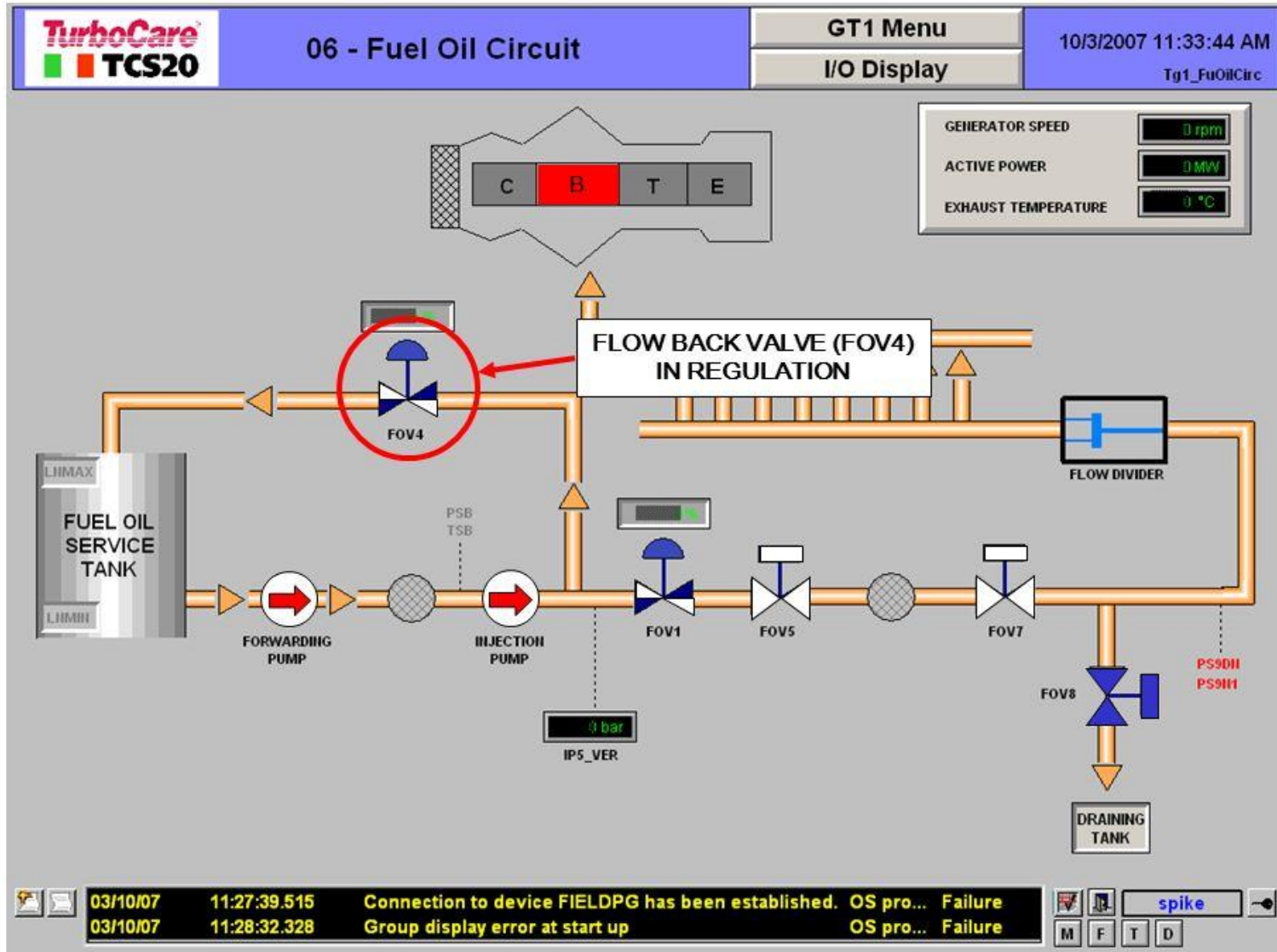
## تغيير أو تحويل زيت الوقود -> وقود الغاز FUEL OIL -> FUEL GAS :

- تغيير الوقود متاح فقط للتوربين الغازي ذو القدرة الفعالة Active Power < (١٠ ميكاواط) .
- تأكد من عدم وجود إشارات تحذيرية Alarms على دورة وقود الغاز Fuel gas circuit .
- تحقق من أن مؤشر تغيير الوقود FUEL CHANGE-OVER موجود على الوضع الذاتي AUTO .

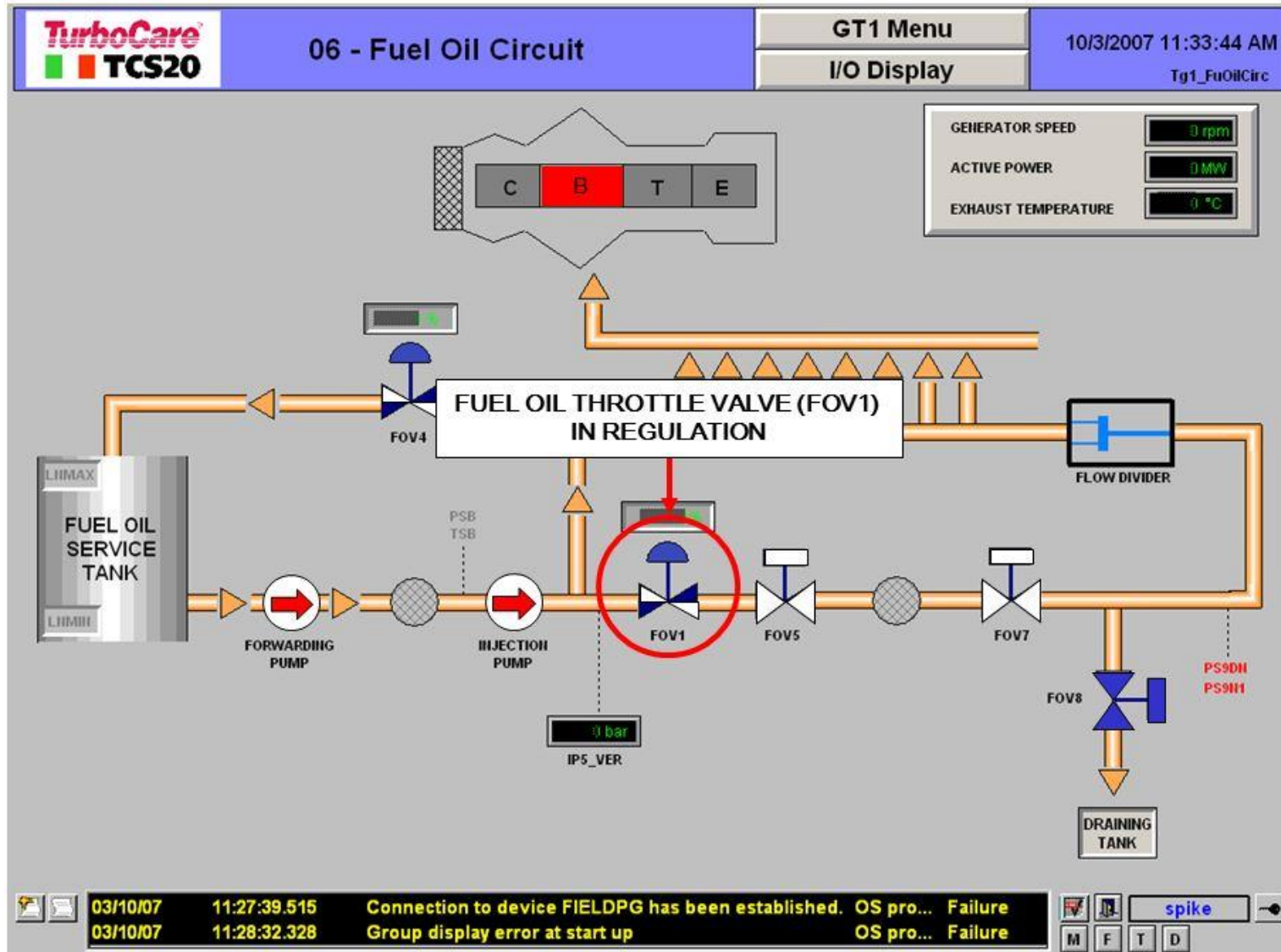
## تغيير أو تحويل زيت الوقود -> وقود الغاز (تابع) FUEL OIL -> FUEL GAS ( continue) :

الشروط الأولية (التحضيرية) لدورة زيت الوقود PRELIMINARY CONDITION FOR FUEL OIL CIRCUIT :

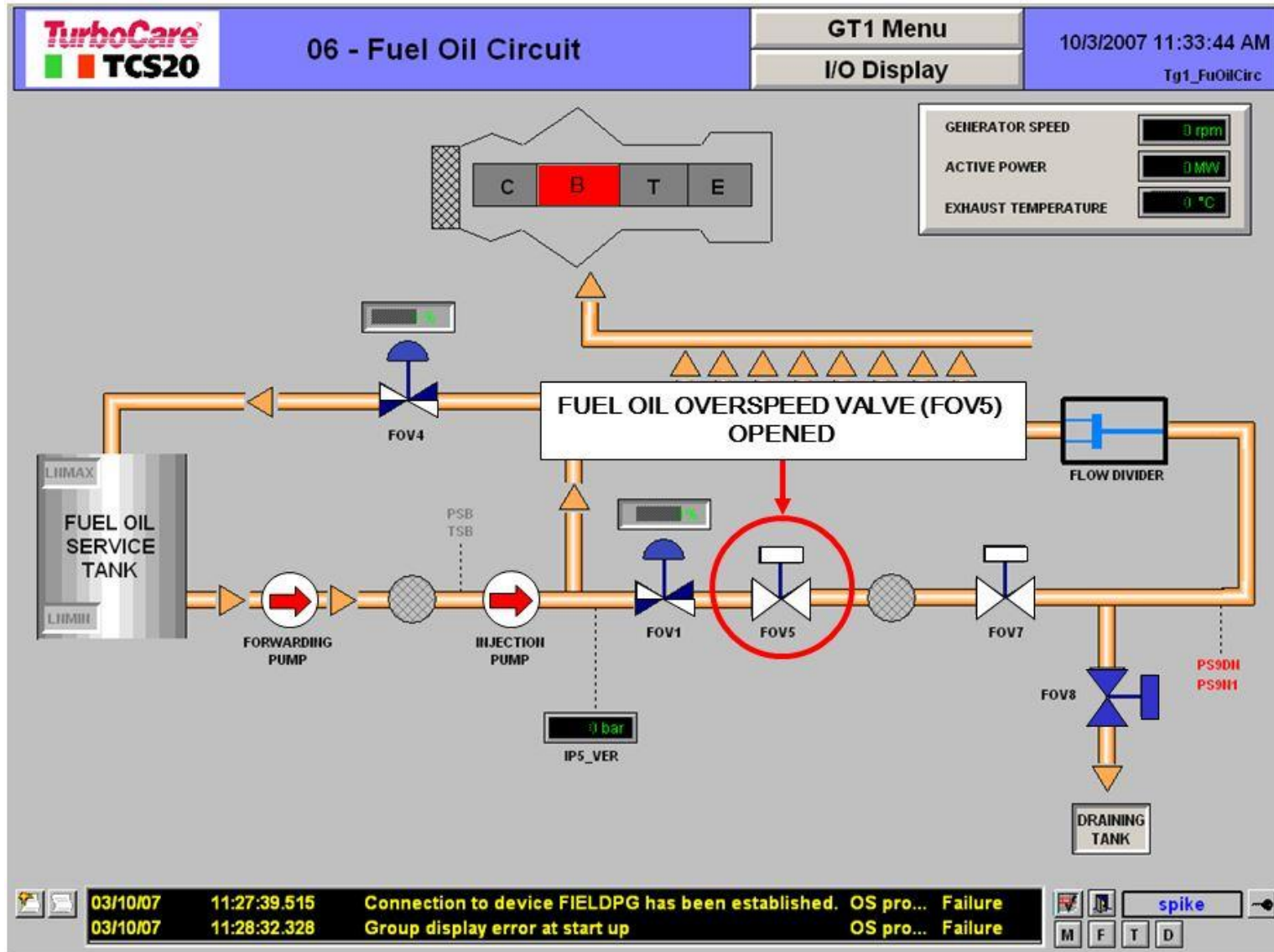




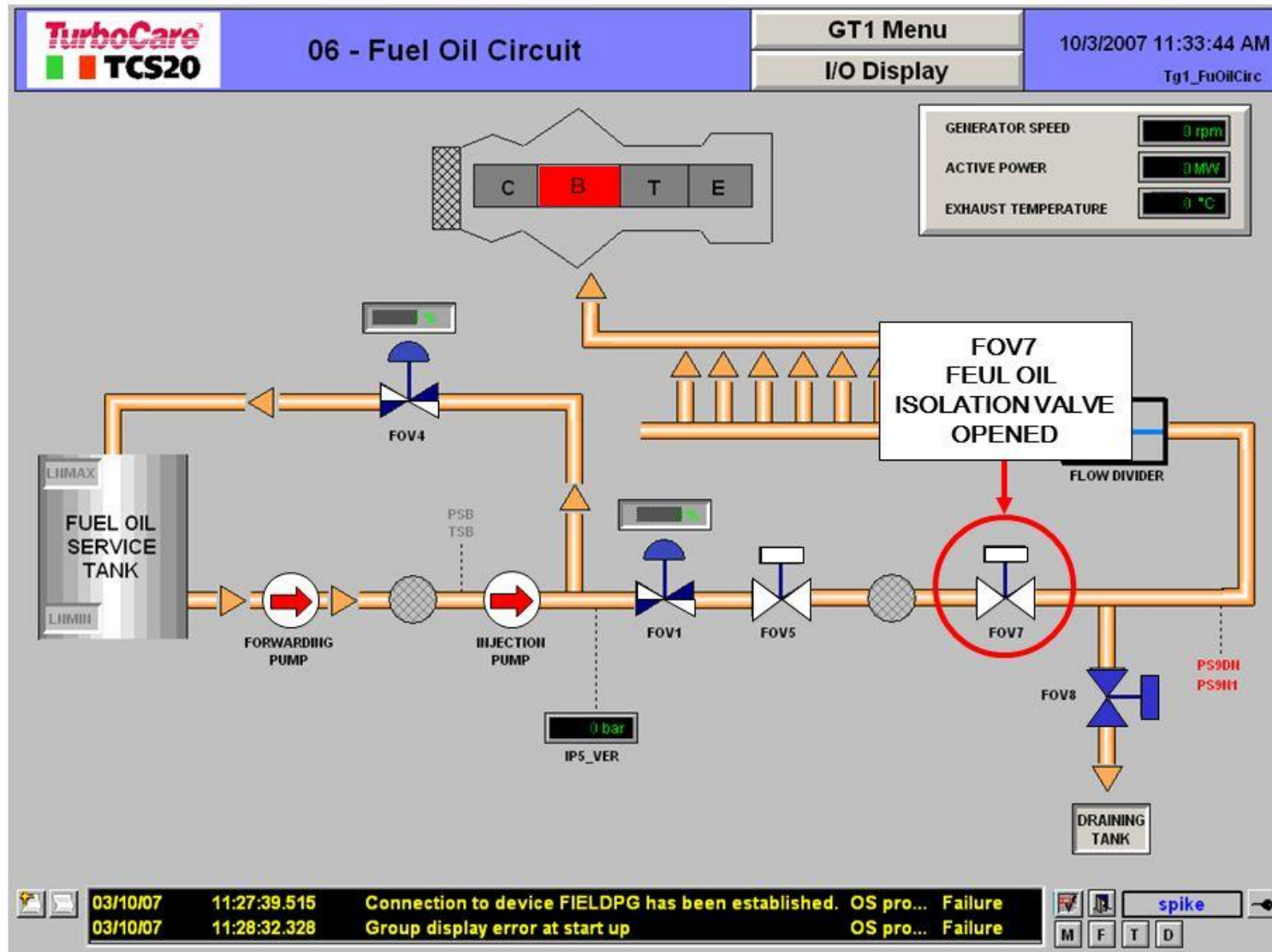
يتم تنظيم صمام التدفق الراجع لزيت الوقود (FOV4)



يتم تنظيم صمام خنق زيت الوقود (FOV1)

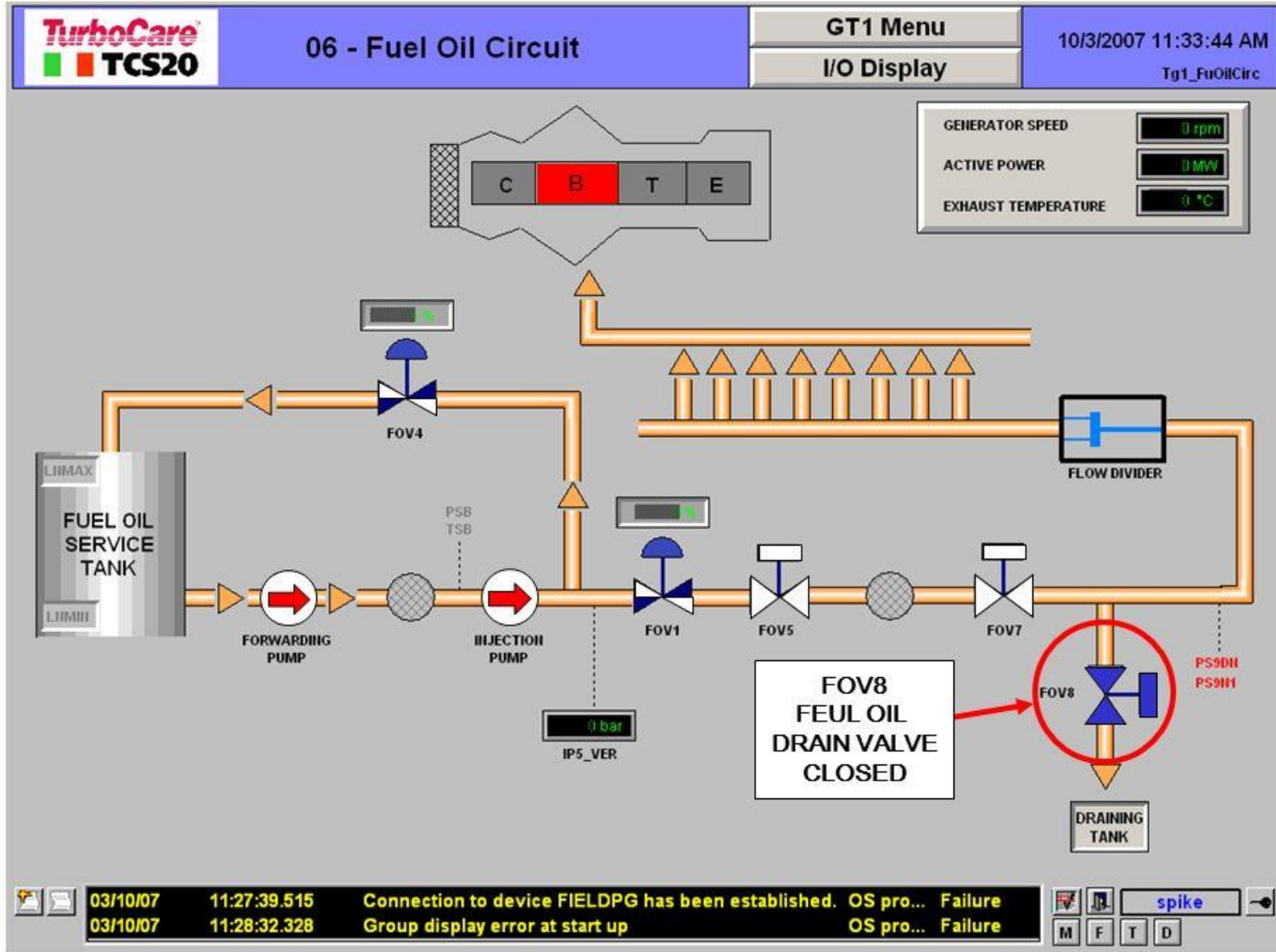


يتم فتح صمام السرعة الزائدة لزيت الوقود (FOV5) Fuel oil overspeed valve



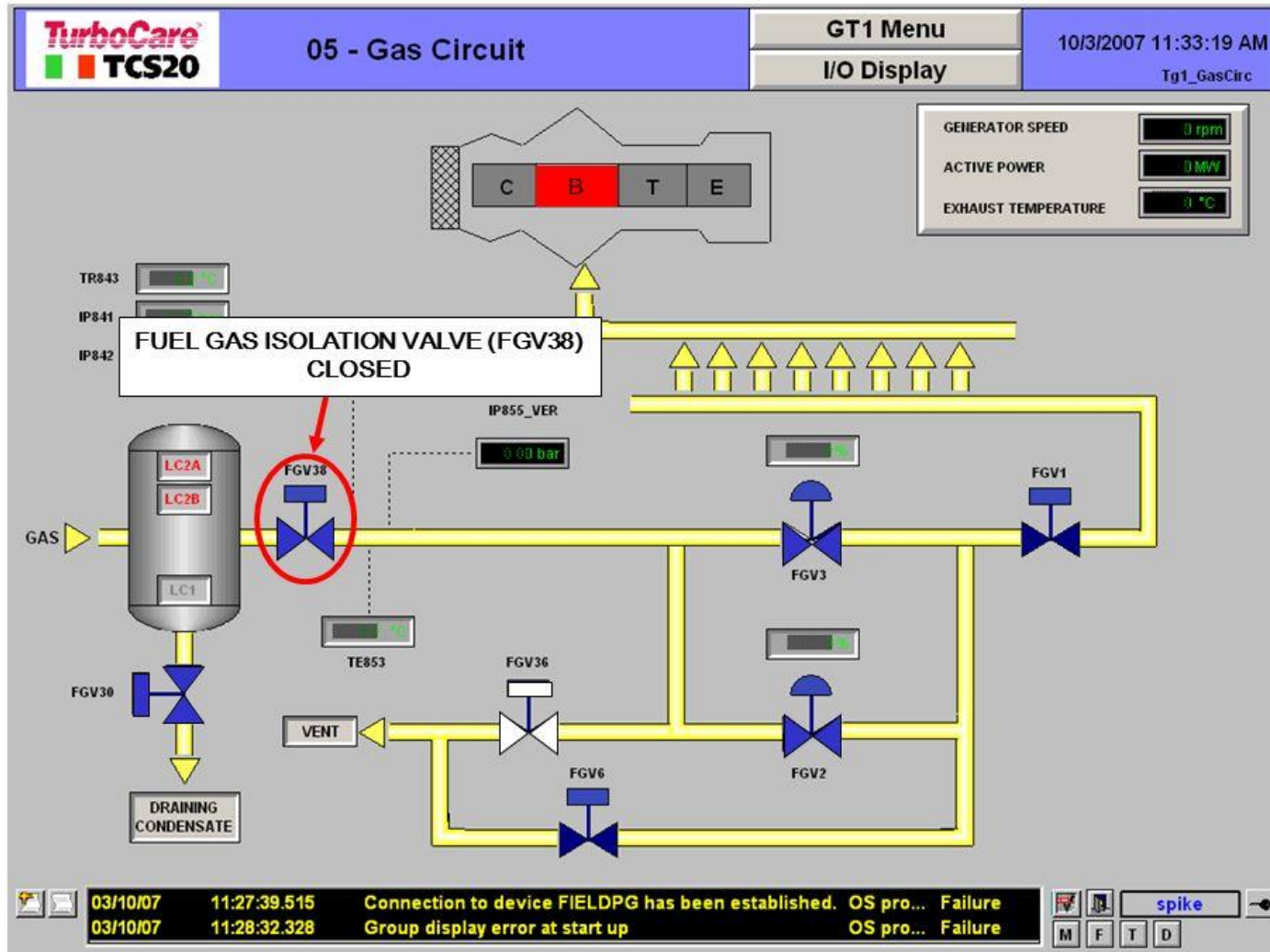
يتم فتح صمام عزل زيت الوقود (FOV7) Fuel oil isolation valve



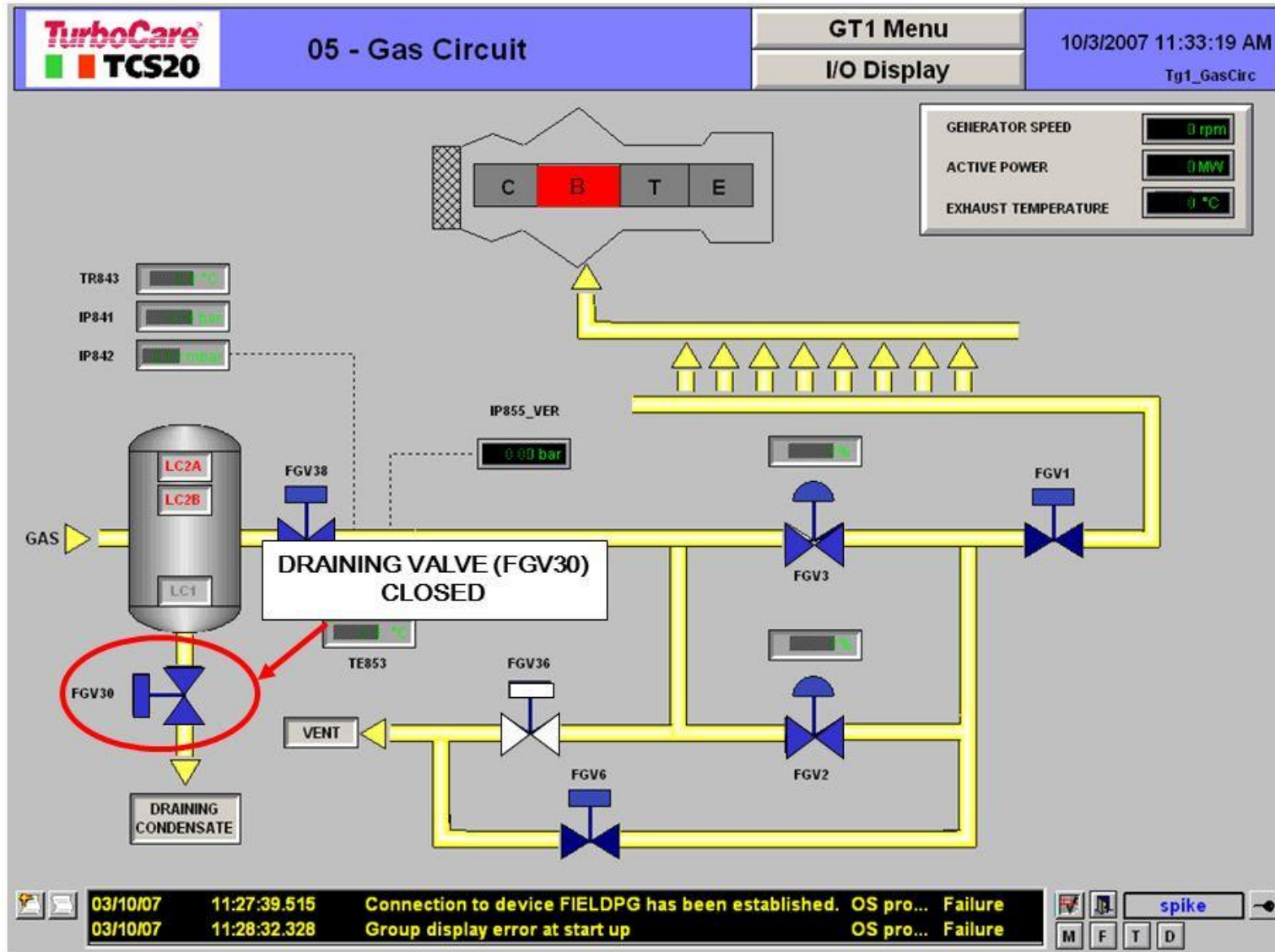


يتم غلق صمام تصريف جامع (مُجمَع) زيت الوقود (FOV8) Fuel oil collector drainage valve

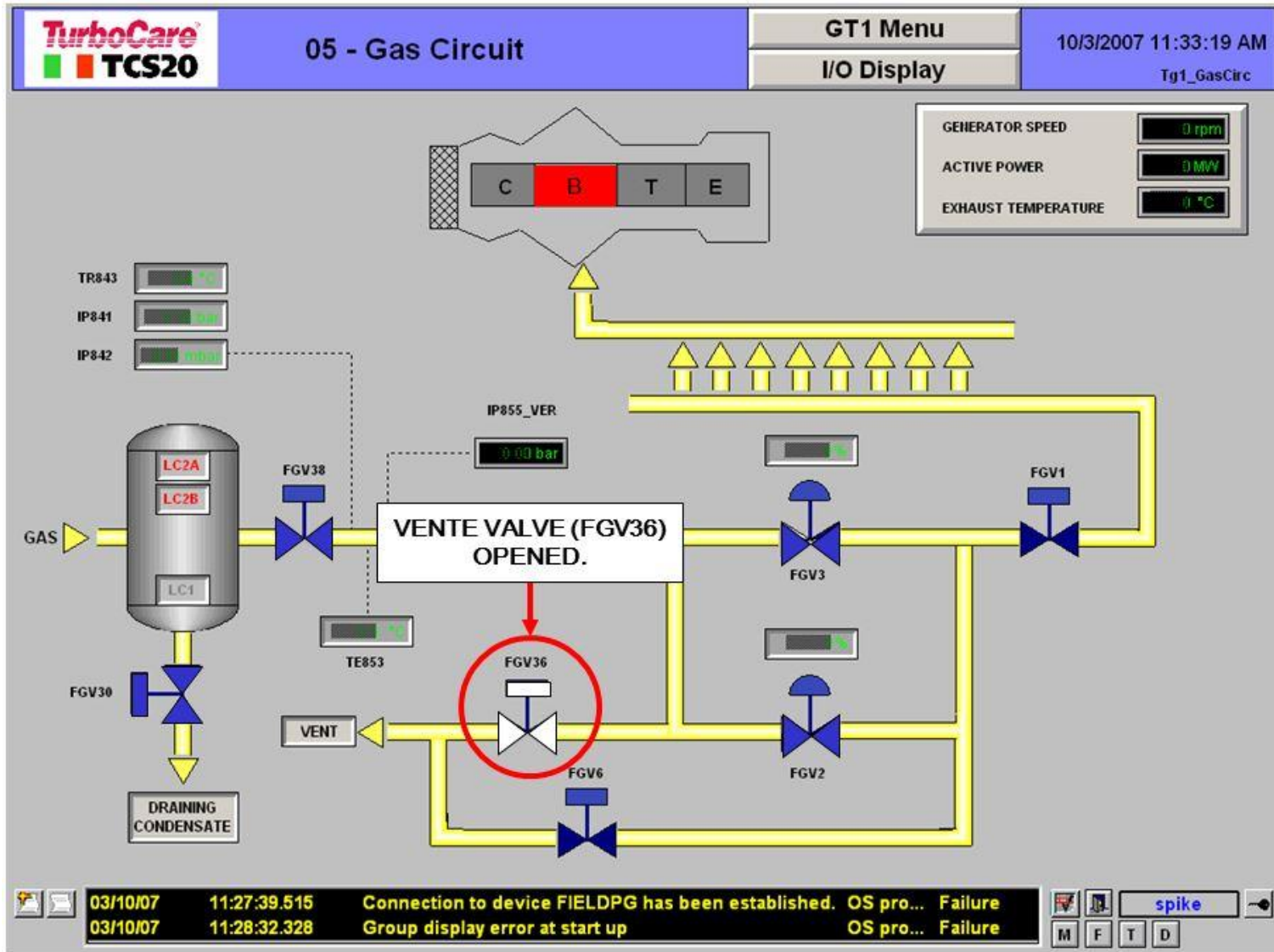
الشروط الأولية (التحضيرية) لدورة وقود الغاز : PRELIMINARY CONDITION FOR FUEL GAS CIRCUIT



يتم غلق صمام عزل وقود الغاز (FGV38) Fuel gas isolation valve

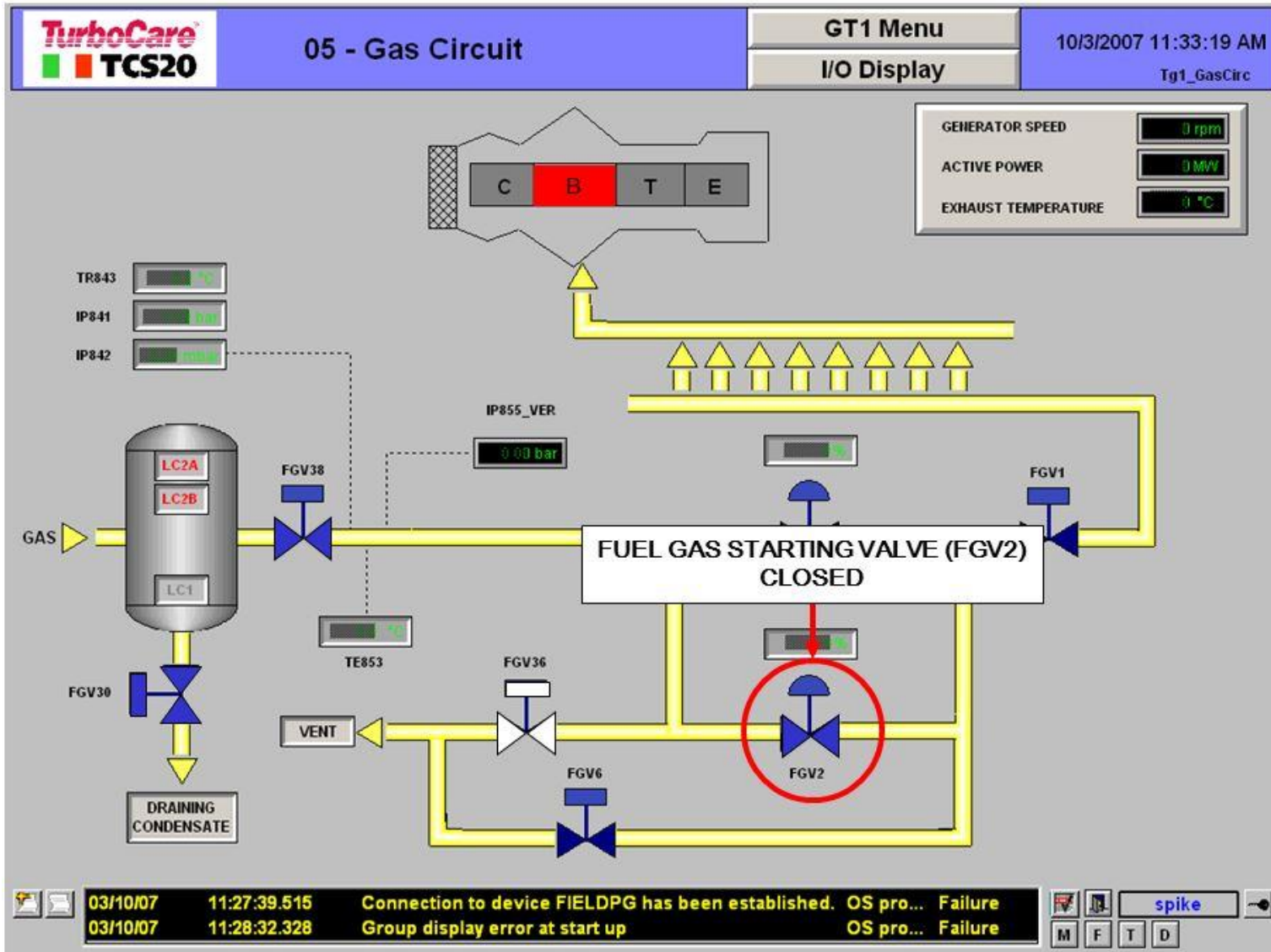


يتم غلق صمام تصريف وقود الغاز المتكثف (FGV30) Fuel draining gas condensate valve (FGV30)

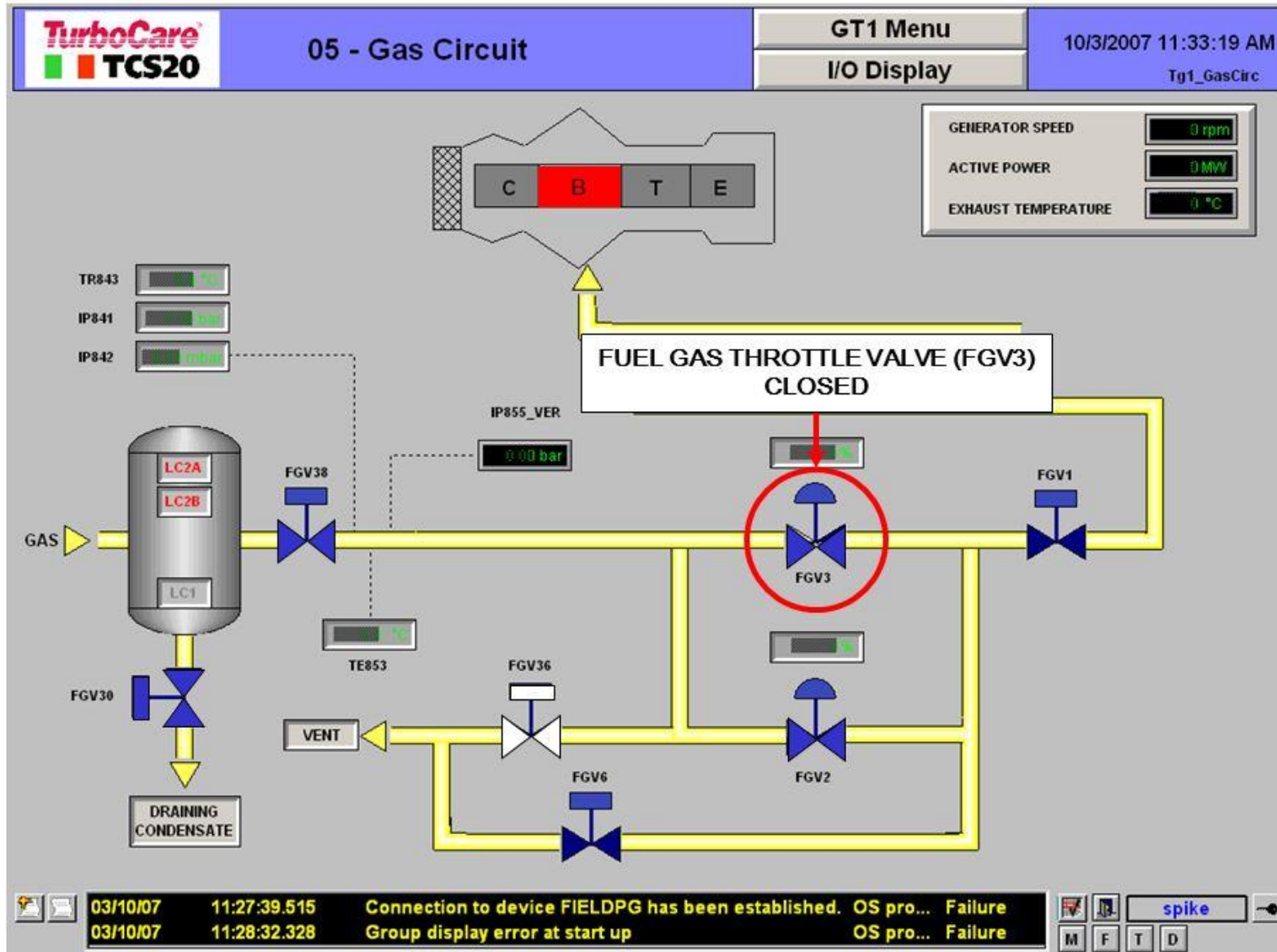


يتم فتح صمام تنفيس وقود الغاز (FGV36) Fuel gas vent valve

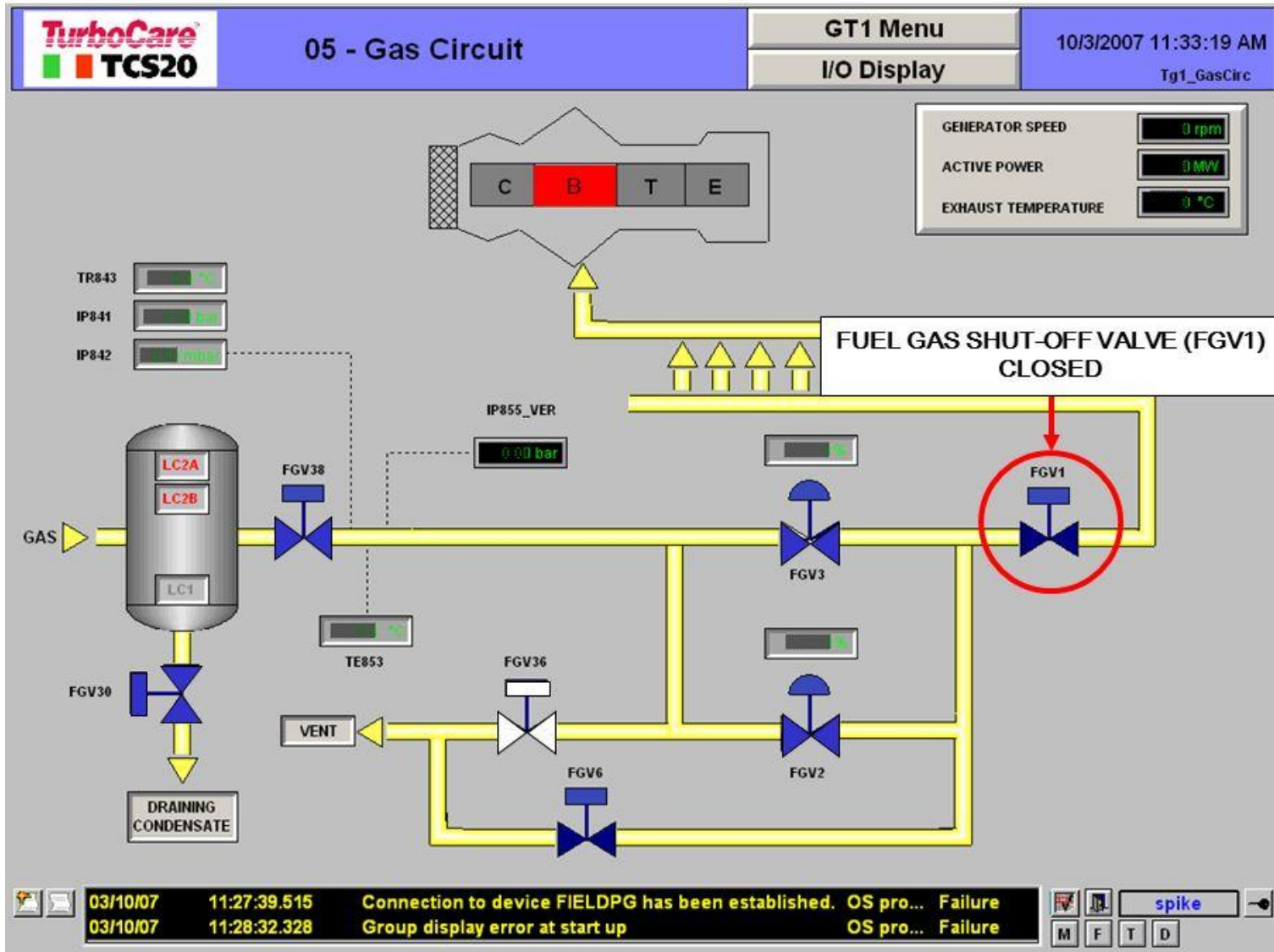




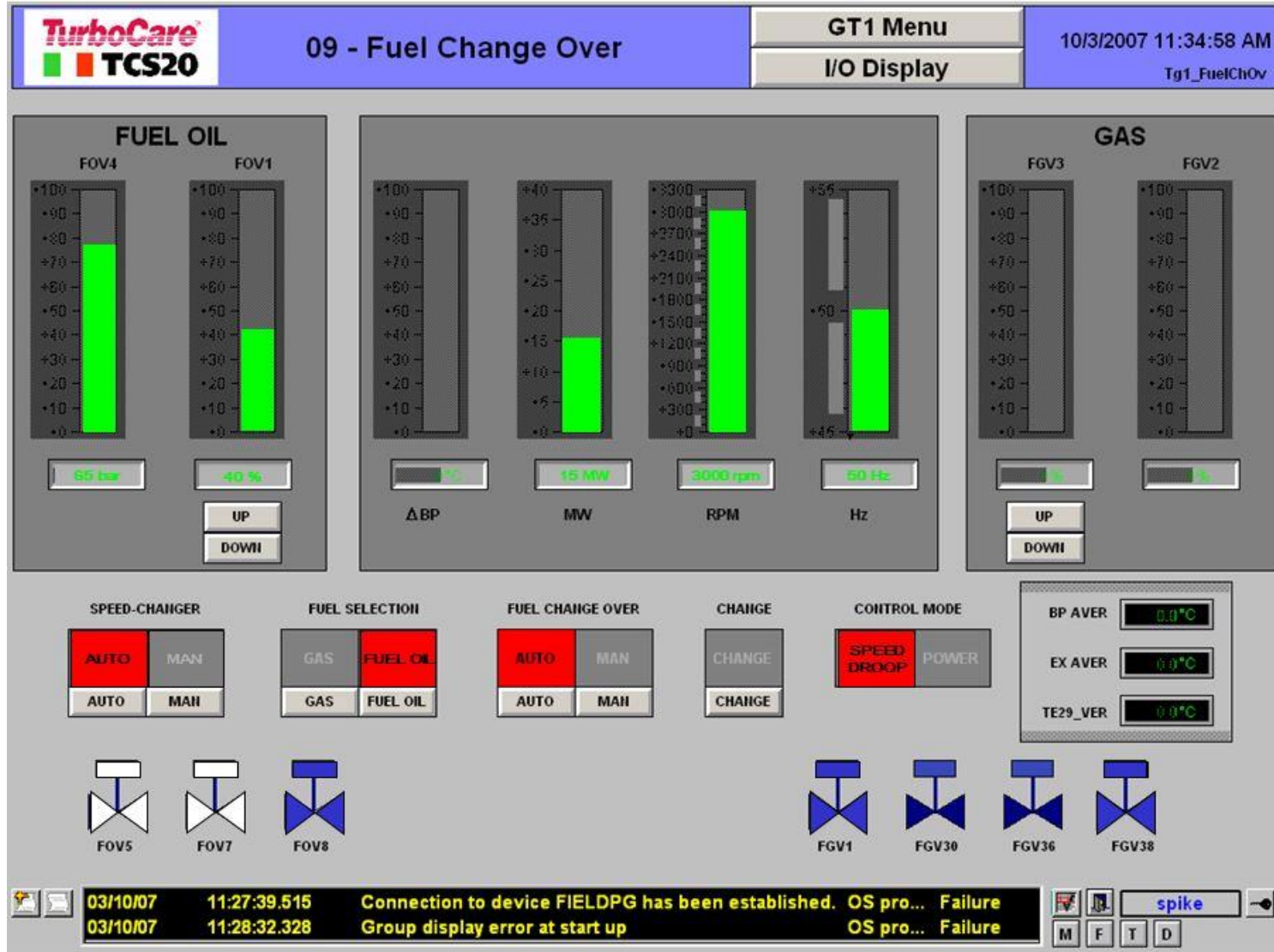
يتم غلق صمام بدء تشغيل وقود الغاز (FGV2) Fuel gas starting valve



يتم غلق صمام خنق وقود الغاز (FGV3) Fuel gas throttle valve

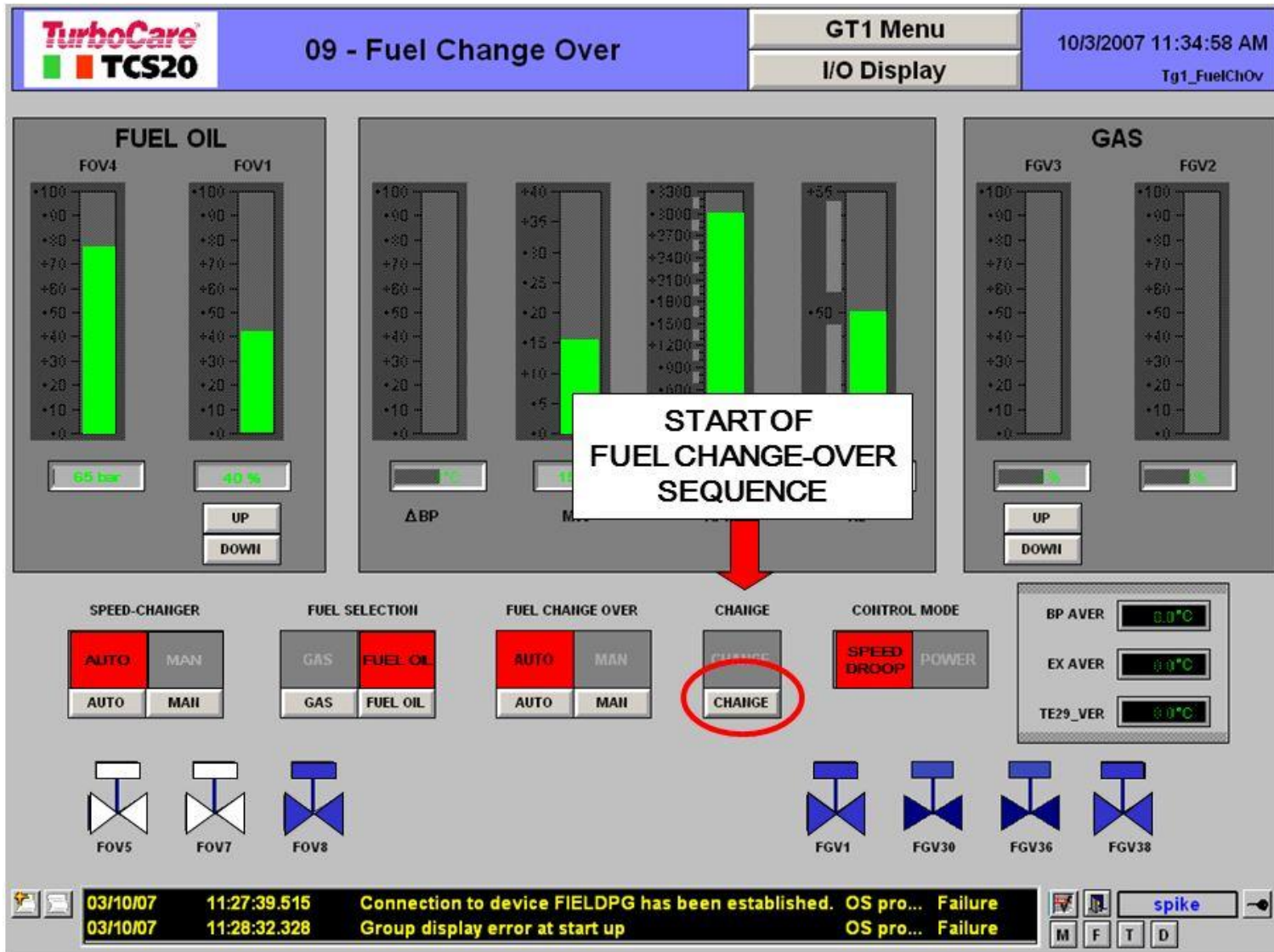


يتم غلق صمام إيقاف أو قطع وقود الغاز (FGV1) Fuel gas shut-off valve

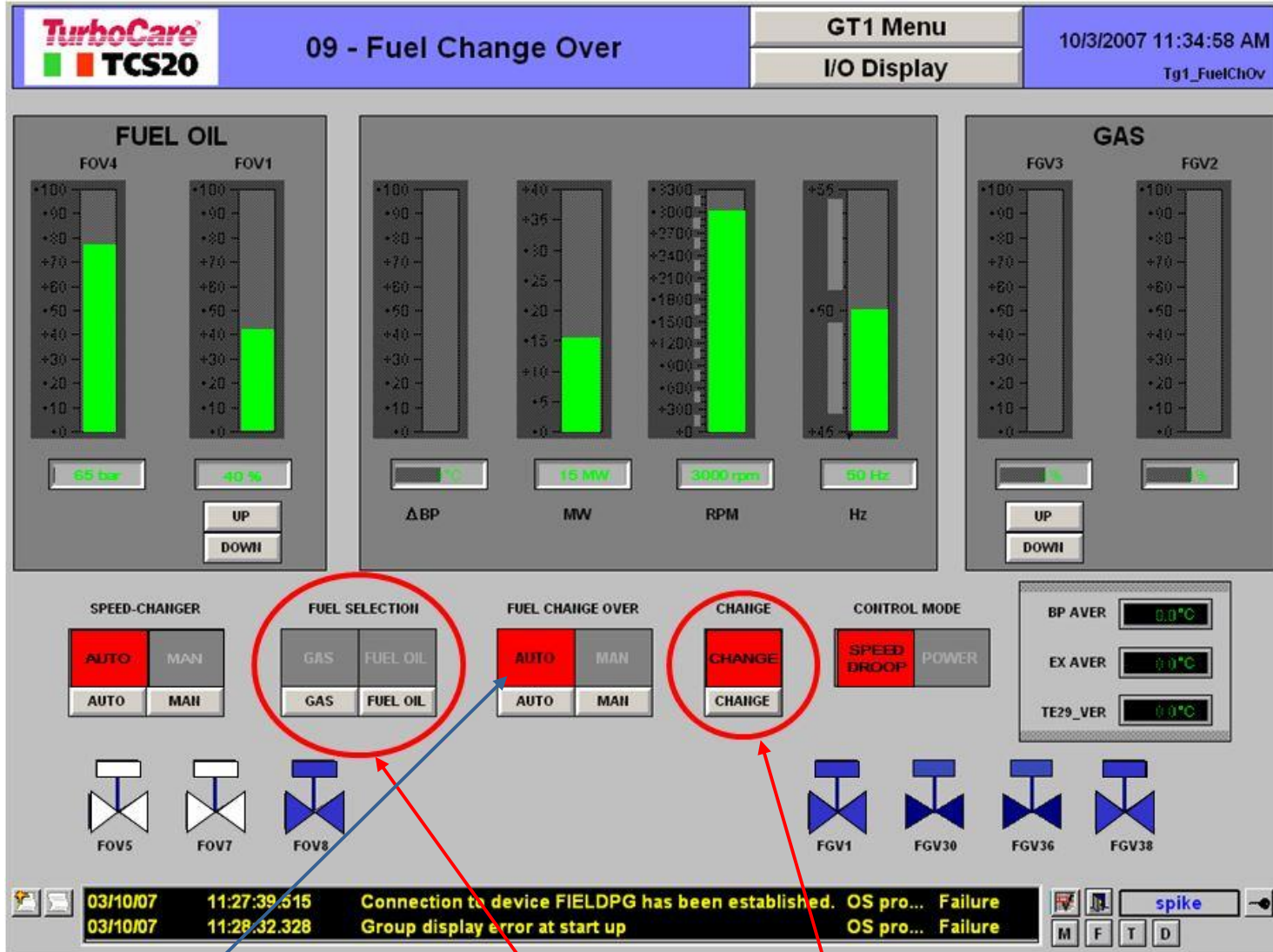


الصفحة الرئيسية لتغيير أو تحويل الوقود Fuel Change Over

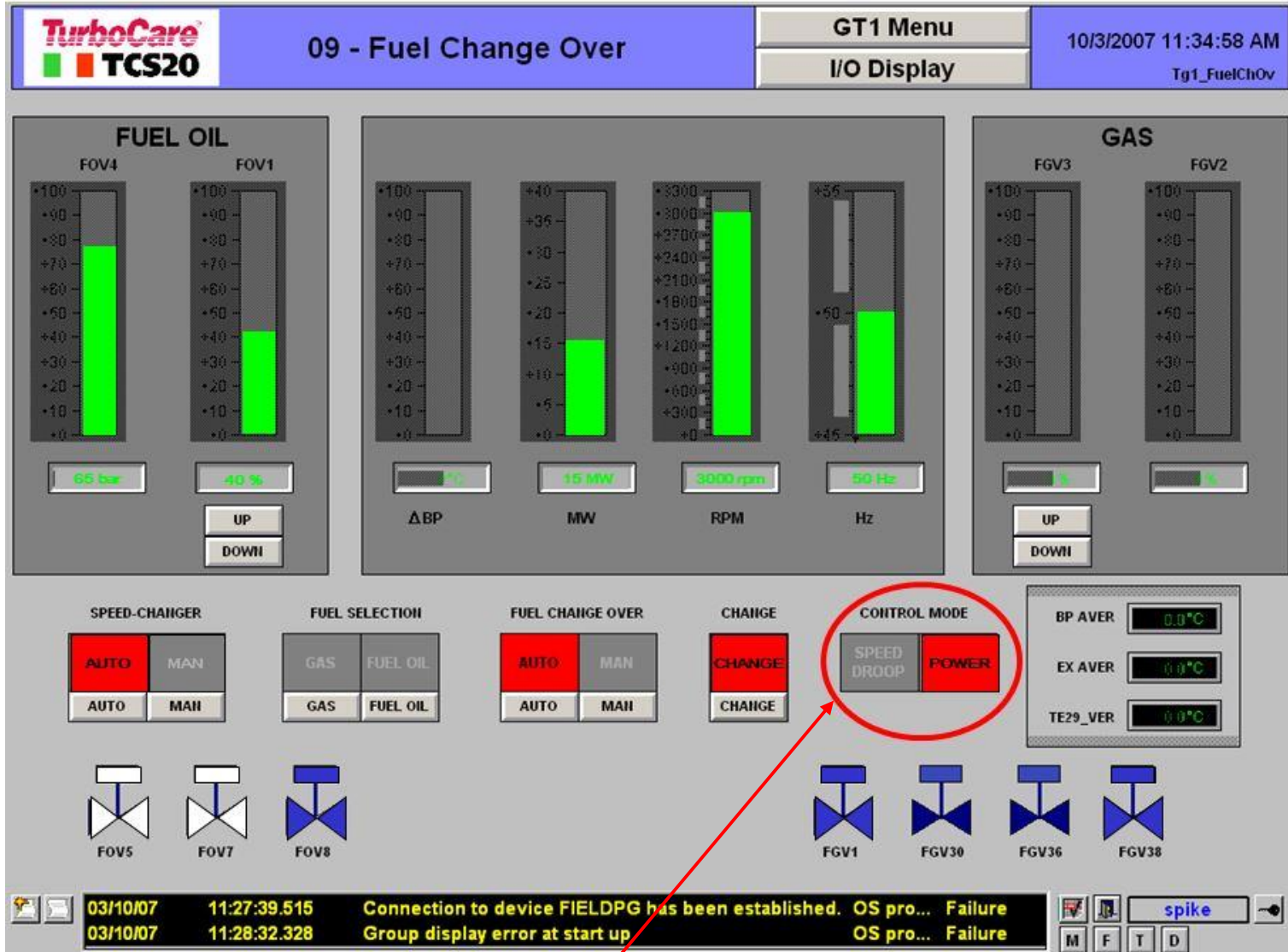




بدء تسلسل خطوات تحويل الوقود START OF FUEL CHANGE-OVER SEQUENCE

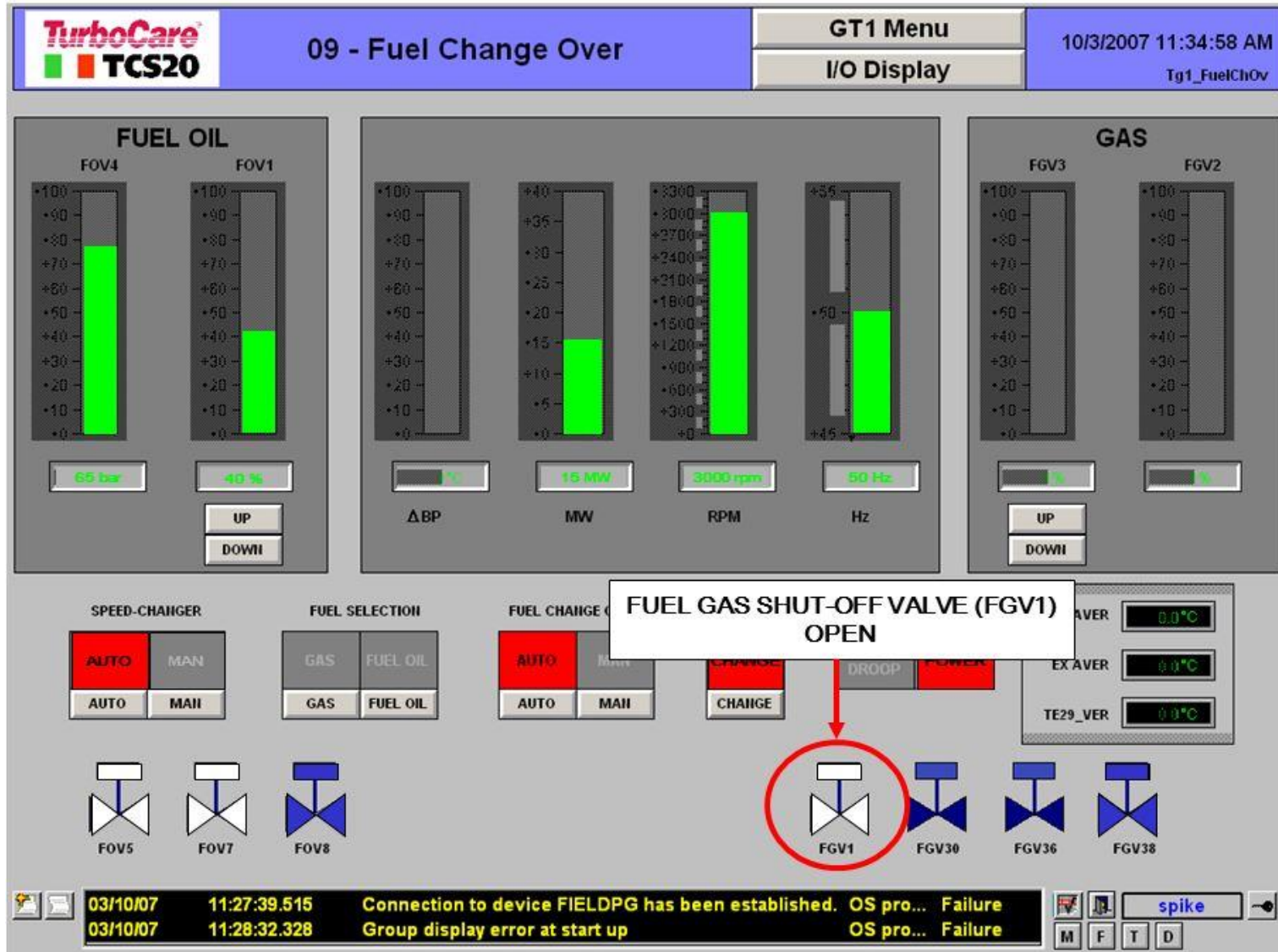


تحريك المؤشر على إشارة تغيير (CHANGE) ، إلغاء إختيار زيت الوقود وتفعيل التغيير CHANGE ، تحقق من أن مؤشر تغيير الوقود ( FULE CHANGE-OVER ) مُحدد على الوضع الذاتي AUTO



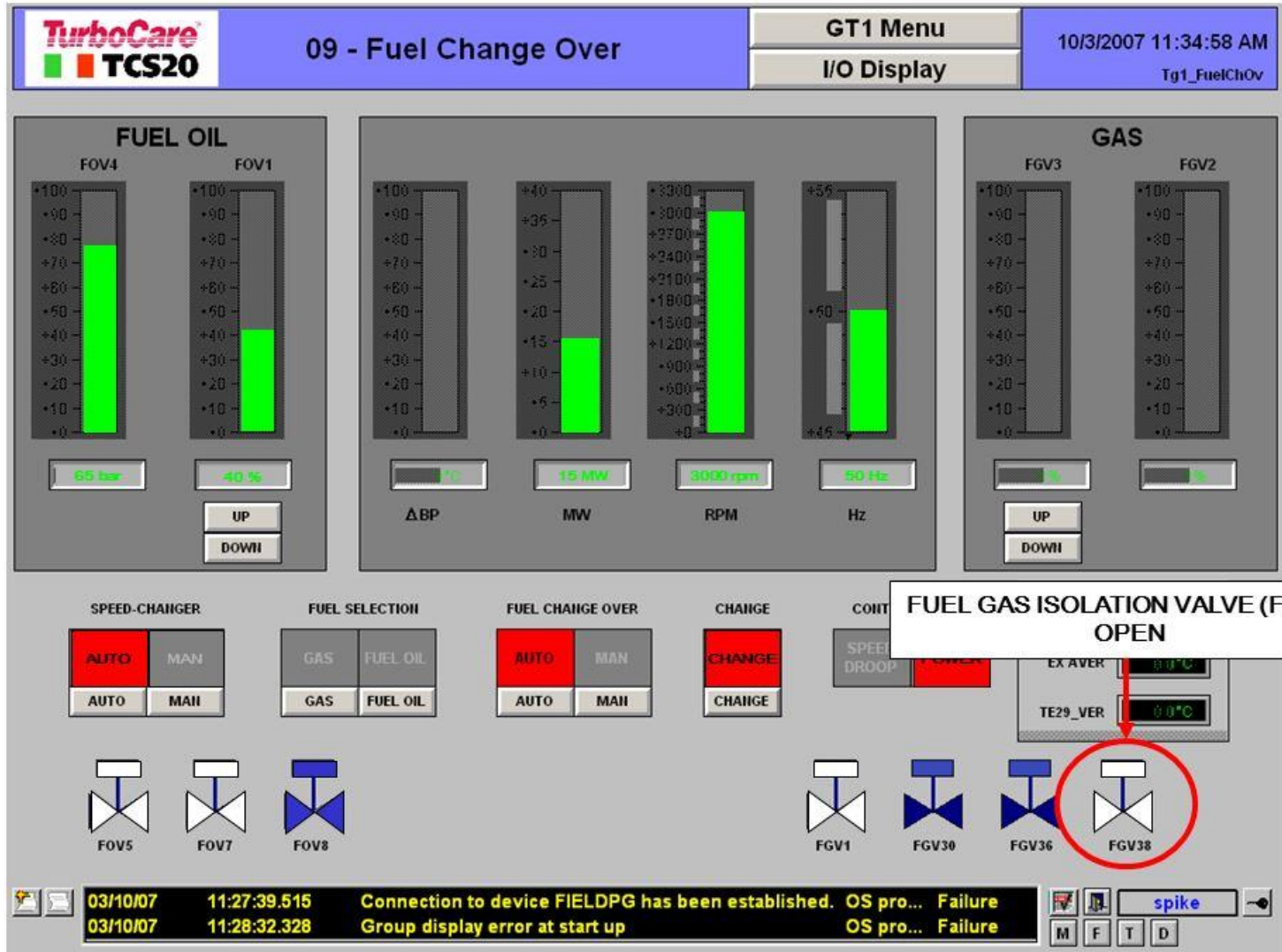
يتم تحويل وضع التحكم CONTROL MODE من نمط أو وضع التحكم في تندي أو إنخفاض السرعة SPEED DROOP إلى نمط التحكم في القدرة POWER



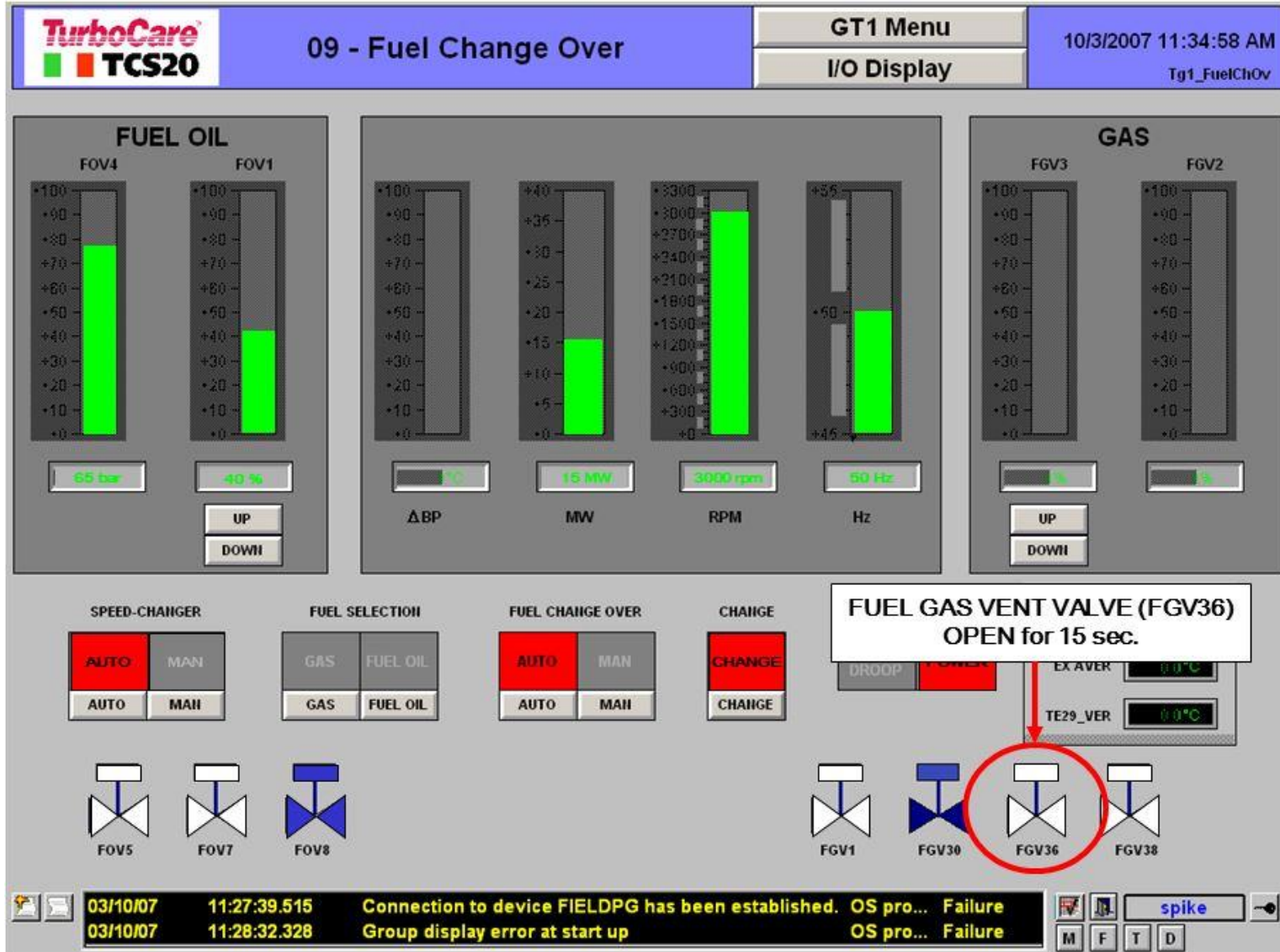


يتم فتح صمام قطع وقود الغاز (FGV1) Fuel gas shut-off valve

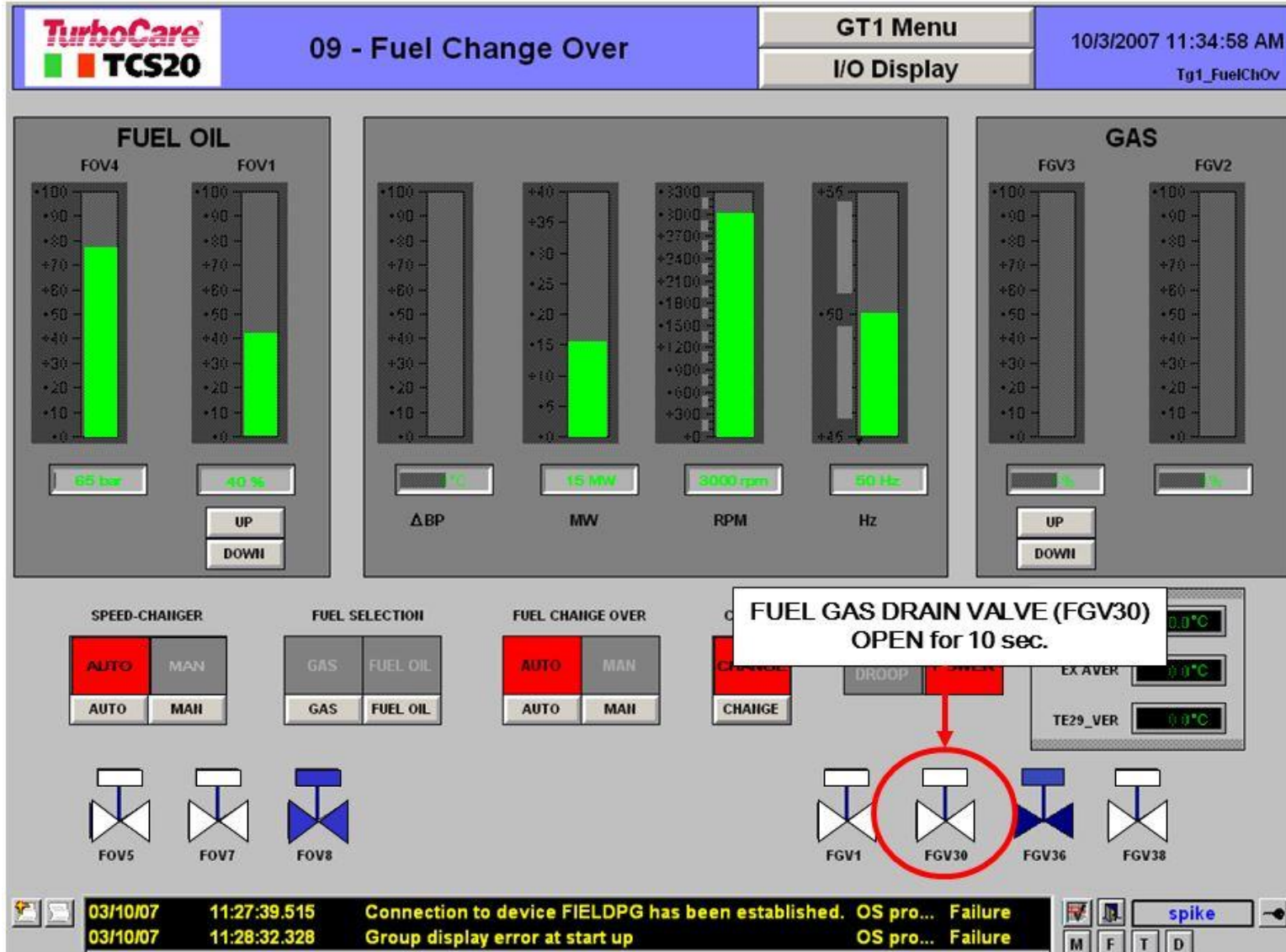




يتم فتح صمام عزل وقود الغاز (FGV38) Fuel gas isolation valve (FGV38)

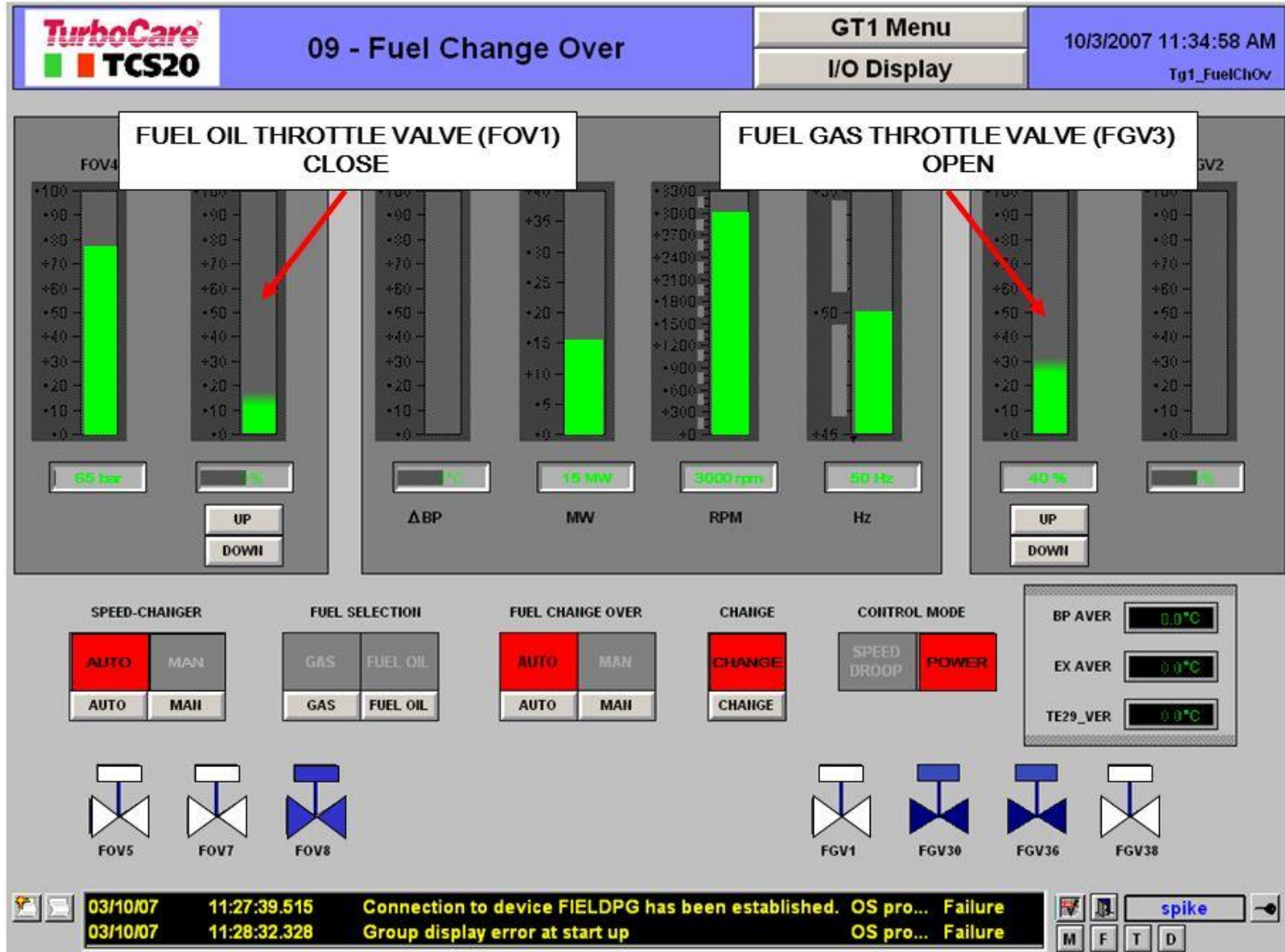


يبقى صمام تنفيس وقود الغاز (FGV36) مفتوحاً لمدة (١٥ ثانية)



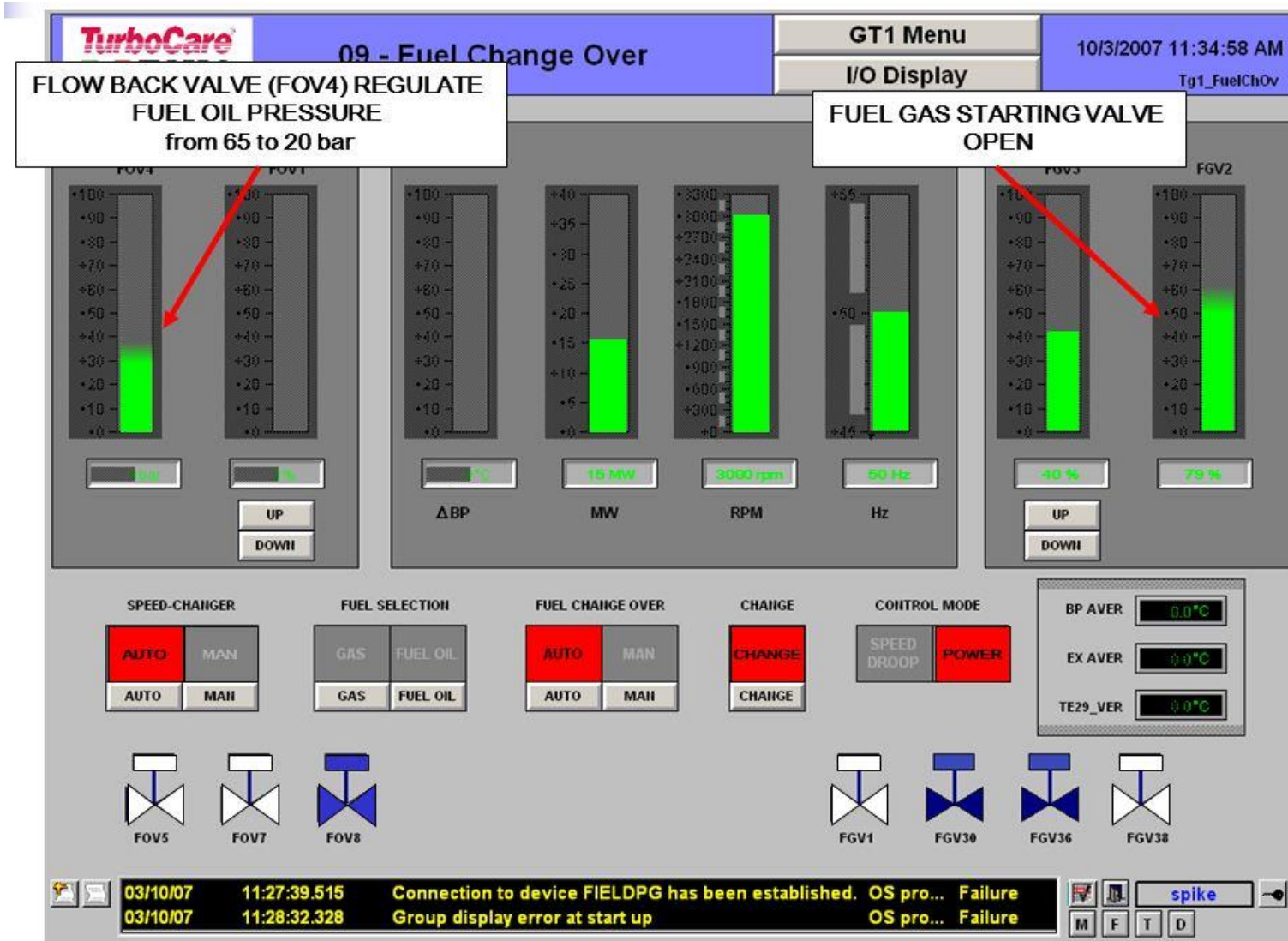
يتم فتح صمام تصريف وقود الغاز المتكثف (FGV30) Fuel draining gas condensate valve لمدة (١٠ ثواني)



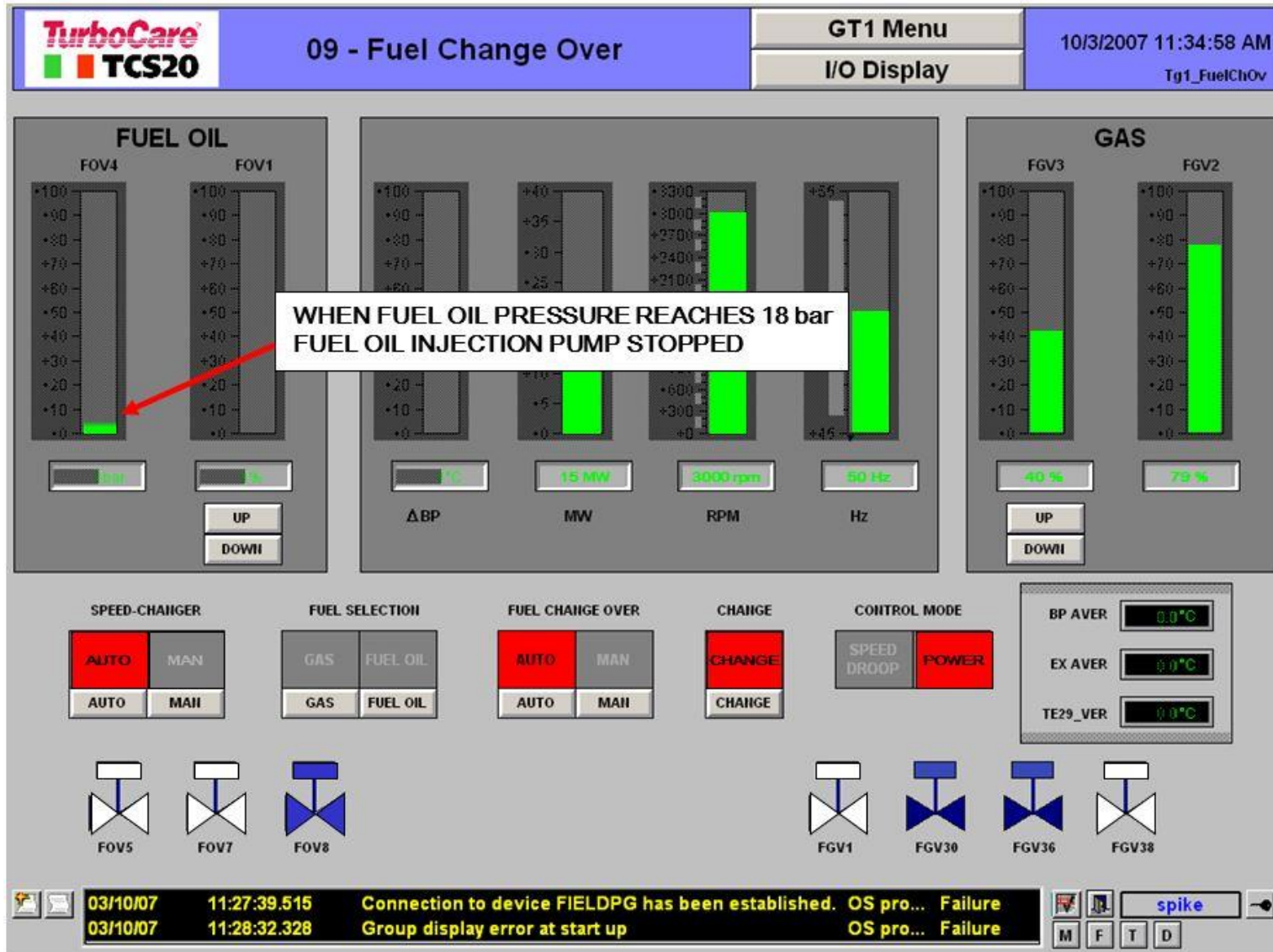


يبدأ التغيير Change-over في صمامات الخنق Throttle valves . حيث يتم فتح صمام خنق وقود الغاز Fuel gas throttle valve FGV3 وفقا لمؤقت التغيير change-over timer (ضبط وبدء خطوة العداد للأعلى) ، وفي نفس الوقت يتم غلق صمام خنق زيت الوقود Fuel oil throttle valve FOV1 وفقا لمؤقت التغيير ( ضبط وبدء خطوة العداد للأسفل) ، حتى الوصول إلى أدنى قيمة

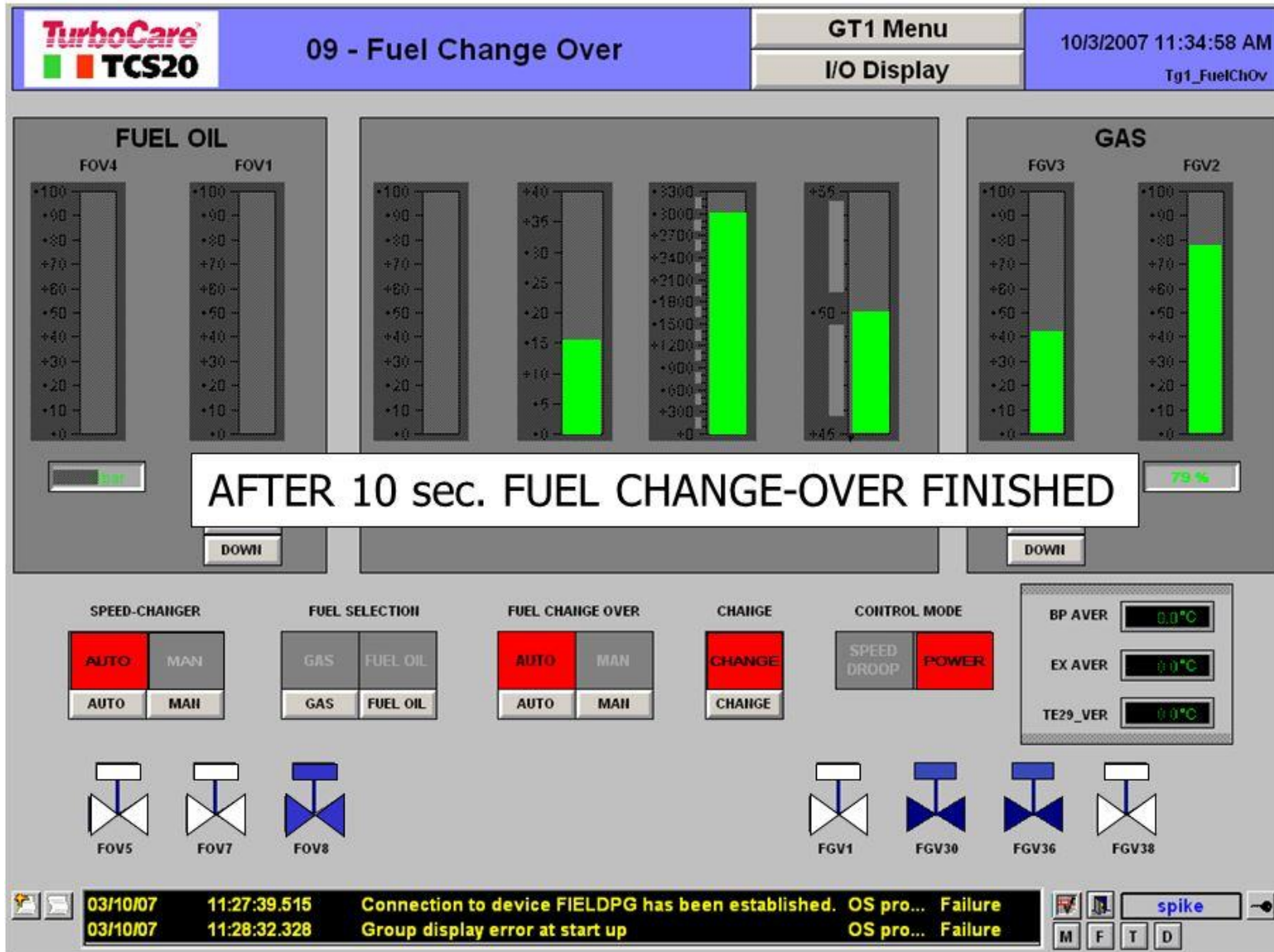




عندما يتم إغلاق صمام خنق زيت الوقود ، سيُنظَّم صمام التدفق الراجع Fuel oil flow back valve FOV4 ضغط زيت الوقود ( من ٦٥ إلى ٢٠ بار )  
وفقا لتدرج زمني Time ramp مُنظَّم مسبقا ، وفي نفس الوقت يتم فتح صمام بدء تشغيل وقود الغاز ( FGV2 ) Fuel gas starting valve وفقا لمهمة أو وظيفة  
تدرج زمني مماثل

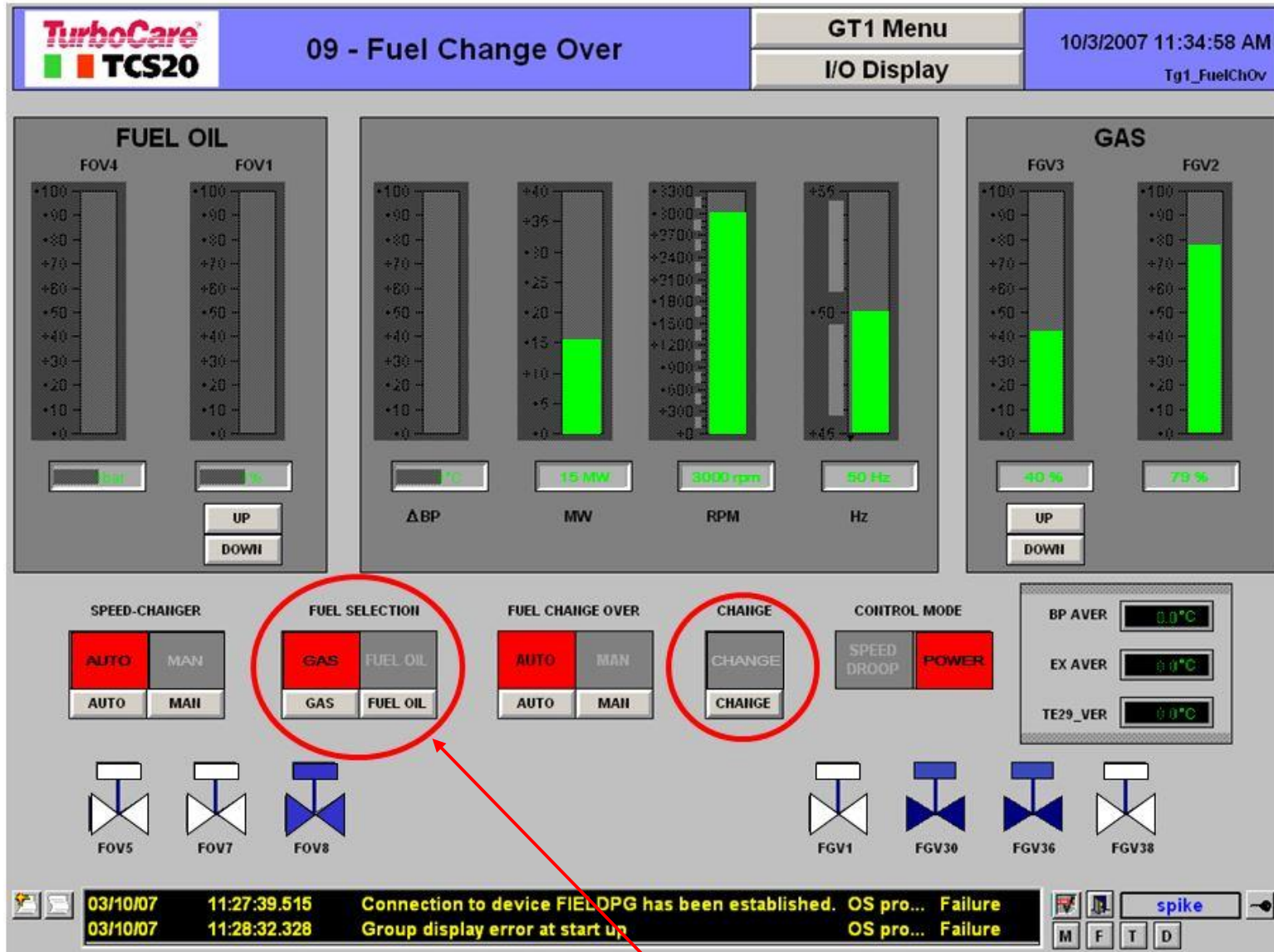


عندما يصل ضغط زيت الوقود إلى بداية (١٨ بار) ، فإن مضخة حقن زيت الوقود Fuel Oil Injection Pump ستتوقف



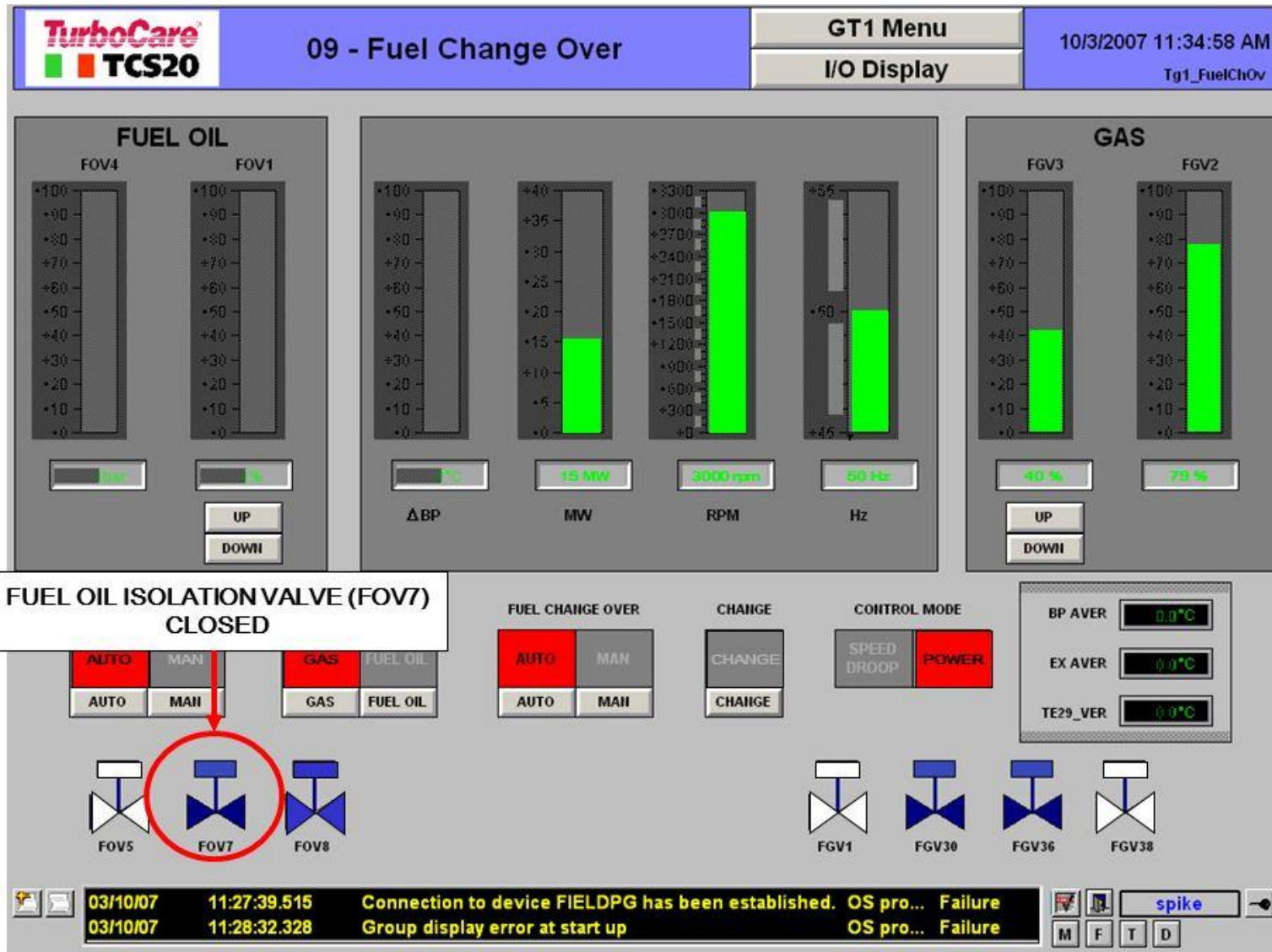
وبعد (١٠ ثواني) ستنتهي عملية التغيير أو التحويل FUEL CHANGE-OVER



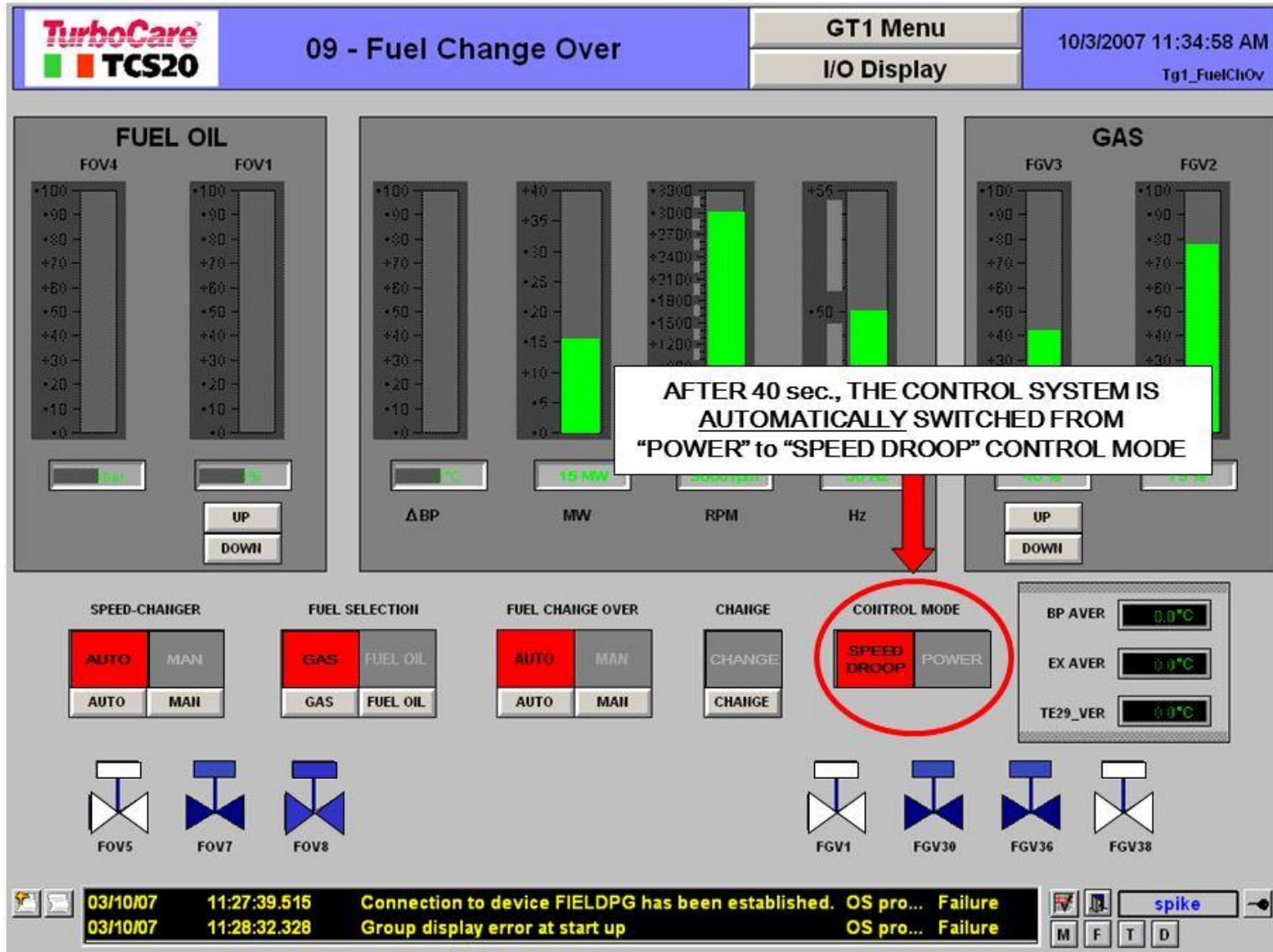


يتم التعرف على حالة نهاية عملية تغيير أو تحويل الوقود Change-Over من خلال تغيير مؤشر إختيار الوقود (FUEL SELECTION) إلى التشغيل على الغاز ( GAS )





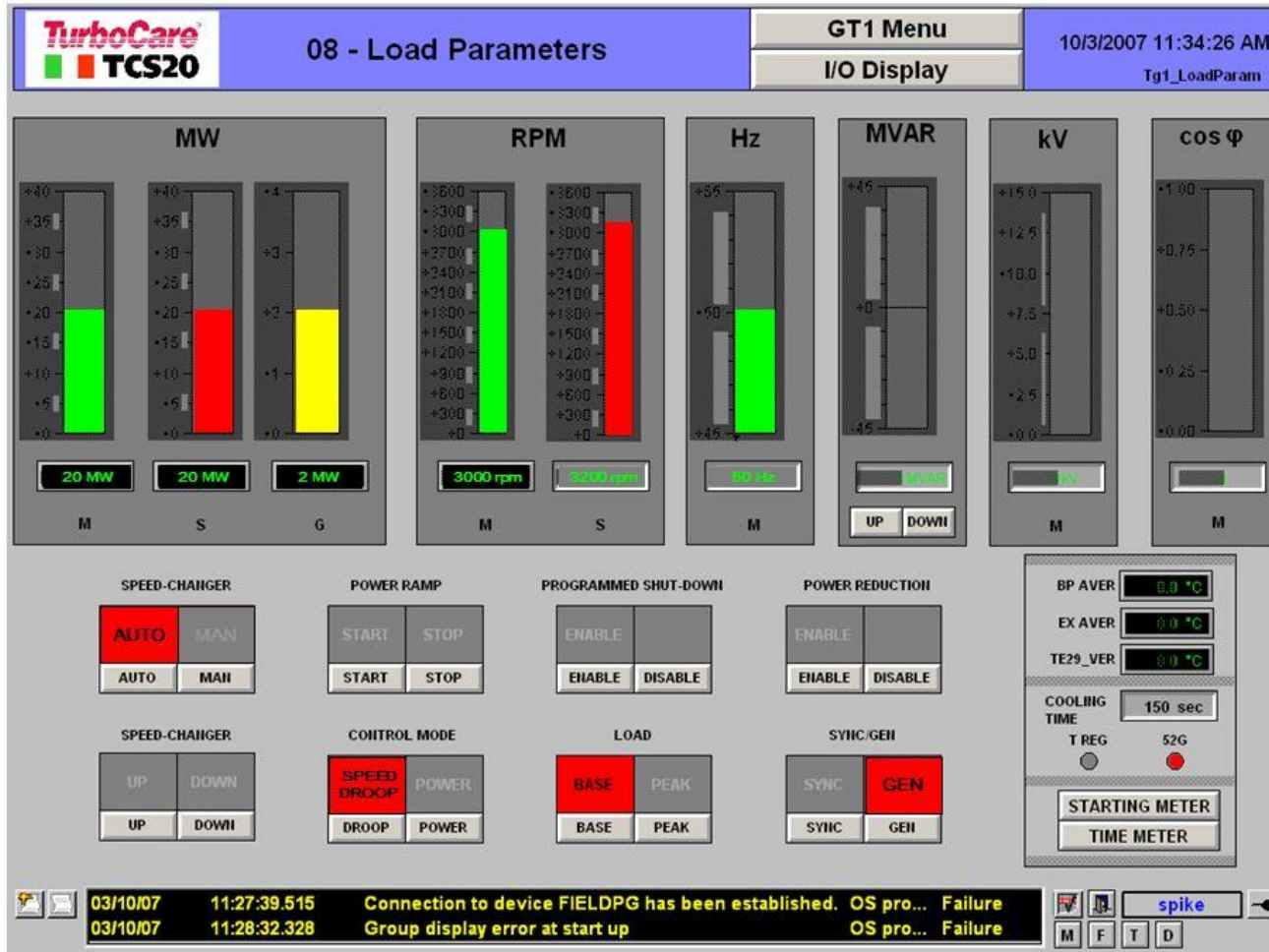
يتم غلق صمام عزل زيت الوقود (FOV7) Fuel oil isolation valve



بعد حوالي (٤٠ ثانية) . يتم تحويل نظام التحكم تلقائياً من (POWER CONTROL MODE) إلى (SPEED DROOP CONTROL MODE)

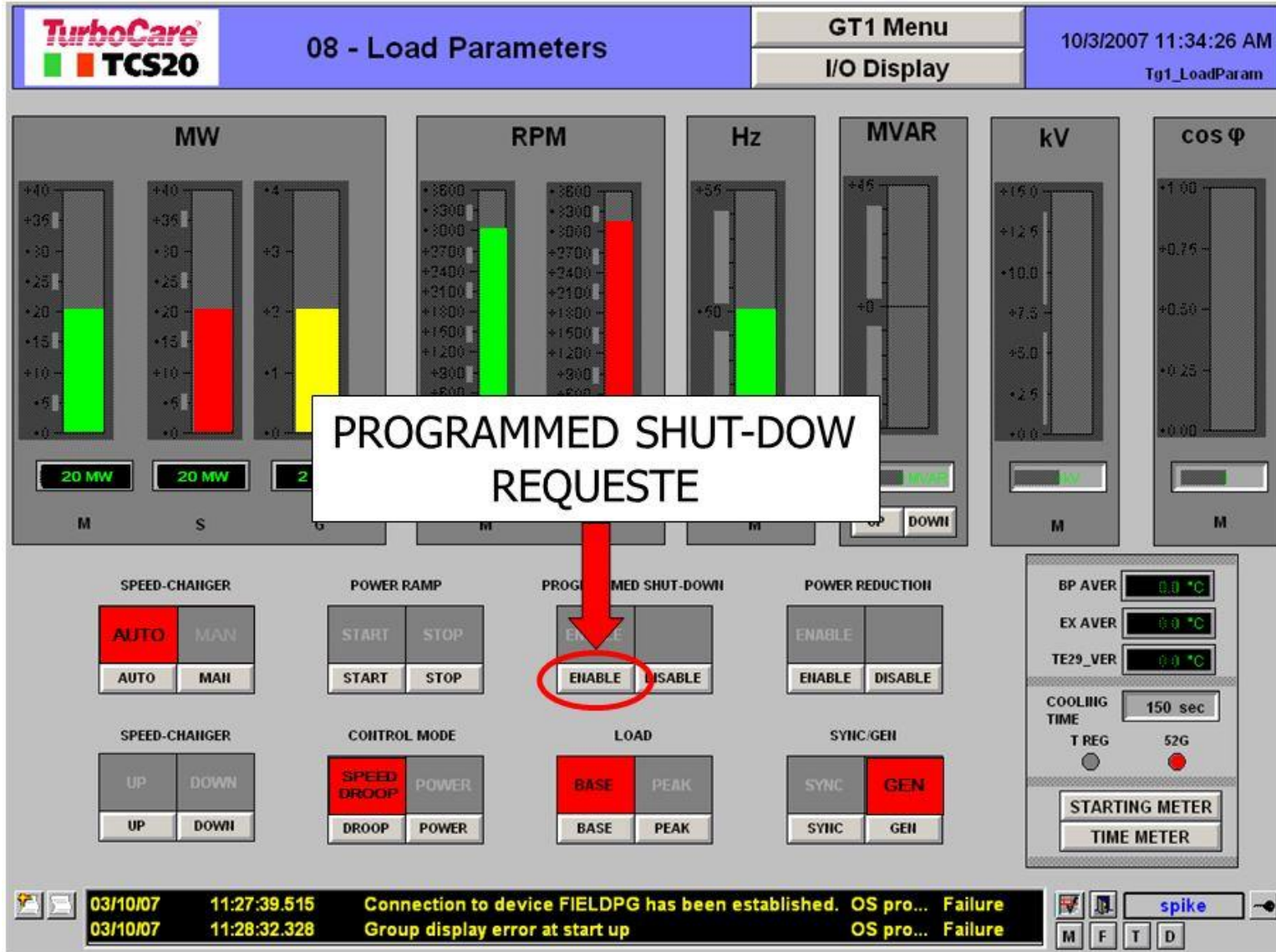
# إيقاف التوربينين : TURBINE SHUT-DOWN

- الإيقاف المبرمج PROGRAMMED SHUT-DOWN



الصفحة الرئيسية لمعالم أو  
متغيرات التحميل  
**LOAD PARAMETERS**





في حالة (إيقاف التشغيل المُبرمج) ، أختار زر الضغط تمكين (ENABLE) الموجود على إشارة إيقاف التشغيل المُبرمج (PROGRAMMED SHUT-DOWN)



**TurboCare**  
**TCS20**

**08 - Load Parameters**

**GT1 Menu**  
**I/O Display**

10/3/2007 11:34:26 AM  
Tg1\_LoadParam

**MW**  
+40  
+35  
+30  
+25  
+20  
+15  
+10  
+5  
+0  
20 MW 20 MW 2 M W  
M S G

**RPM**  
+3600  
+3300  
+3000  
+2700  
+2400  
+2100  
+1800  
+1500  
50 Hz  
M S

**Hz**  
+55  
+50  
+45  
50 Hz  
M

**MVAR**  
+45  
+0  
-45  
UP DOWN  
MVAR  
M

**kV**  
+15.0  
+12.5  
+10.0  
+7.5  
+5.0  
+2.5  
+0.0  
kV  
M

**COS Φ**  
+1.00  
+0.75  
+0.50  
+0.25  
+0.00  
M

**SPEED-CHANGER**  
AUTO MAN  
AUTO MAH

**POWER RAMP**  
START STOP  
START STOP

**PROGRAMMED SHUT-DOWN**  
ENABLE DISABLE  
ENABLE DISABLE

**POWER REDUCTION**  
ENABLE DISABLE  
ENABLE DISABLE

**SPEED-CHANGER**  
UP DOWN  
UP DOWN

**CONTROL MODE**  
SPEED DROOP POWER  
DROOP POWER

**LOAD**  
BASE PEAK  
BASE PEAK

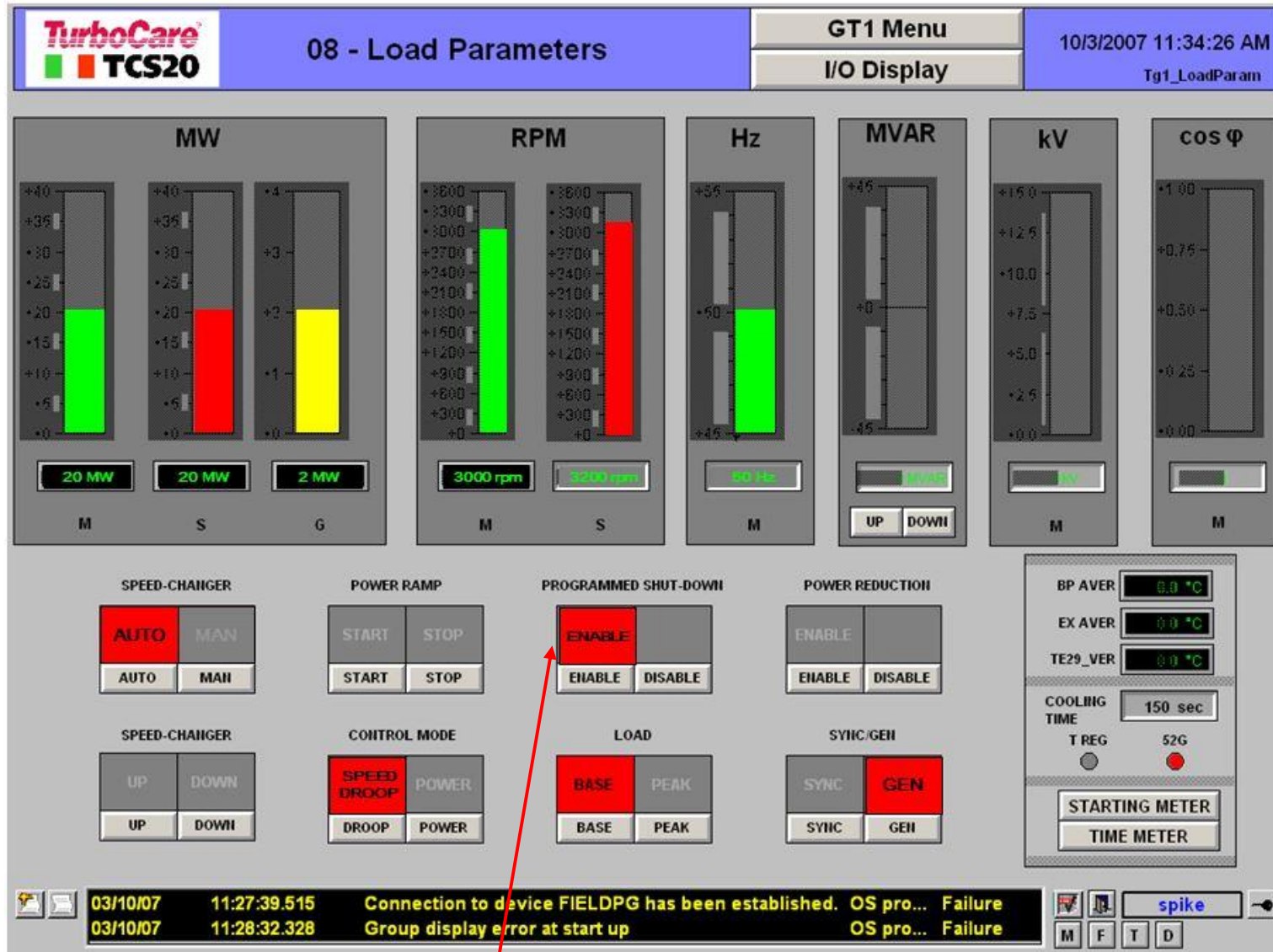
**SYNC/GEN**  
SYNC GEN  
SYNC GEN

BP AVER 0.0 °C  
EX AVER 0.0 °C  
TE29\_VER 0.0 °C  
COOLING TIME 150 sec  
T REG 52G  
STARTING METER  
TIME METER

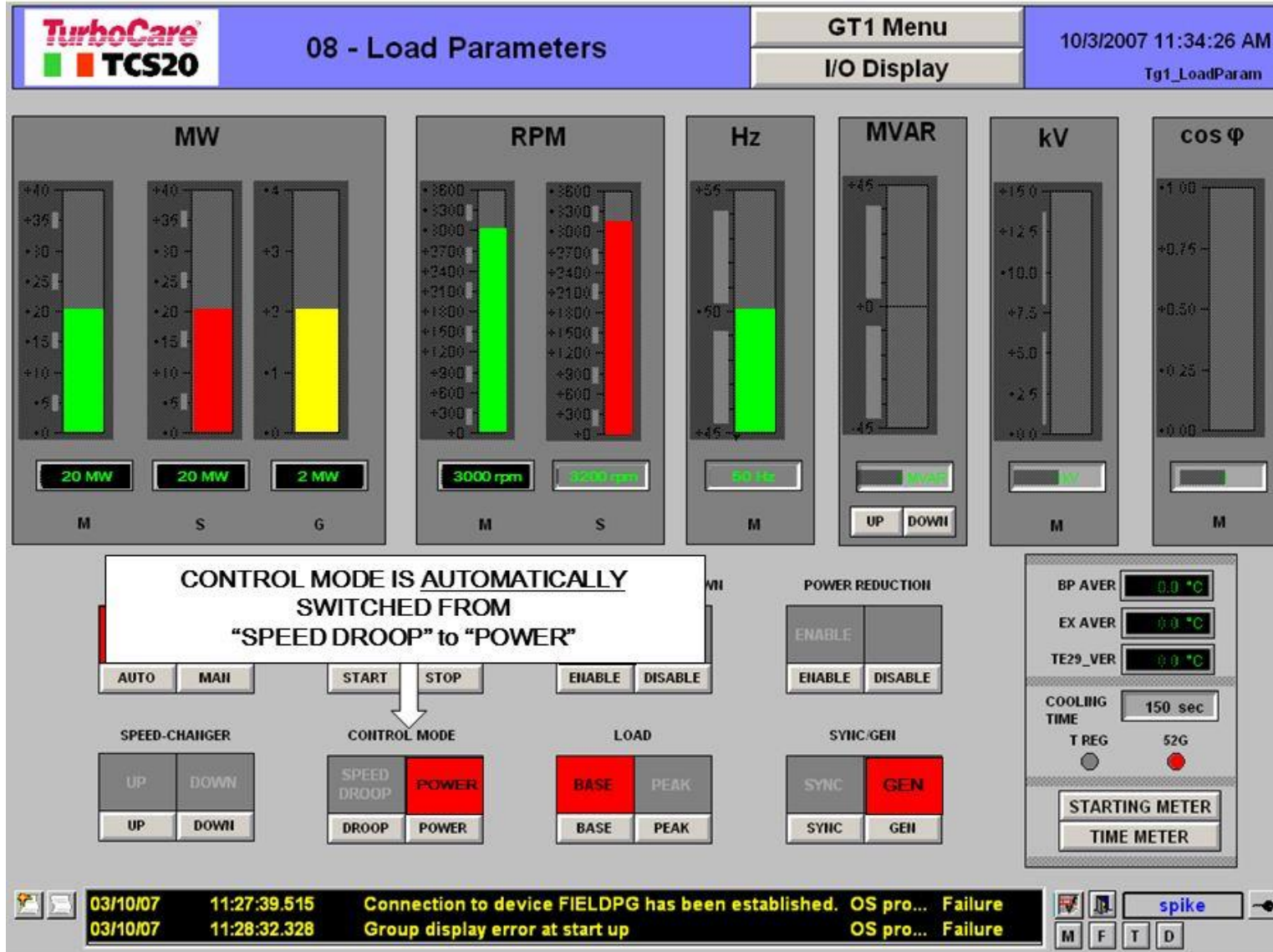
03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure

spike  
M F T D

الضغط على مفتاح تأكيد (CONFIRM)

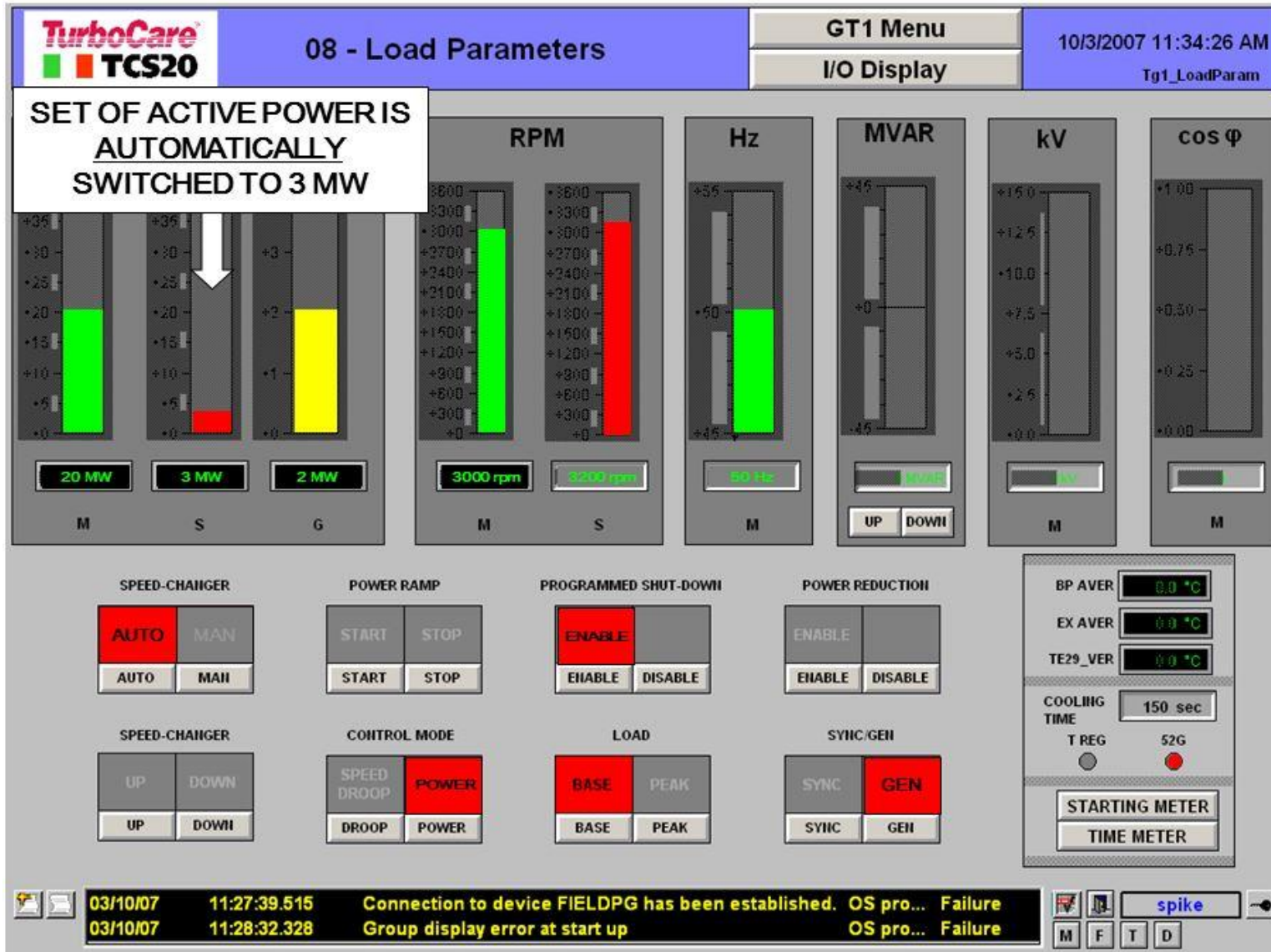


تم تفعيل أو تنشيط إشارة إيقاف التشغيل المُبرمج ( PROGRAMMED SHUT-DOWN )



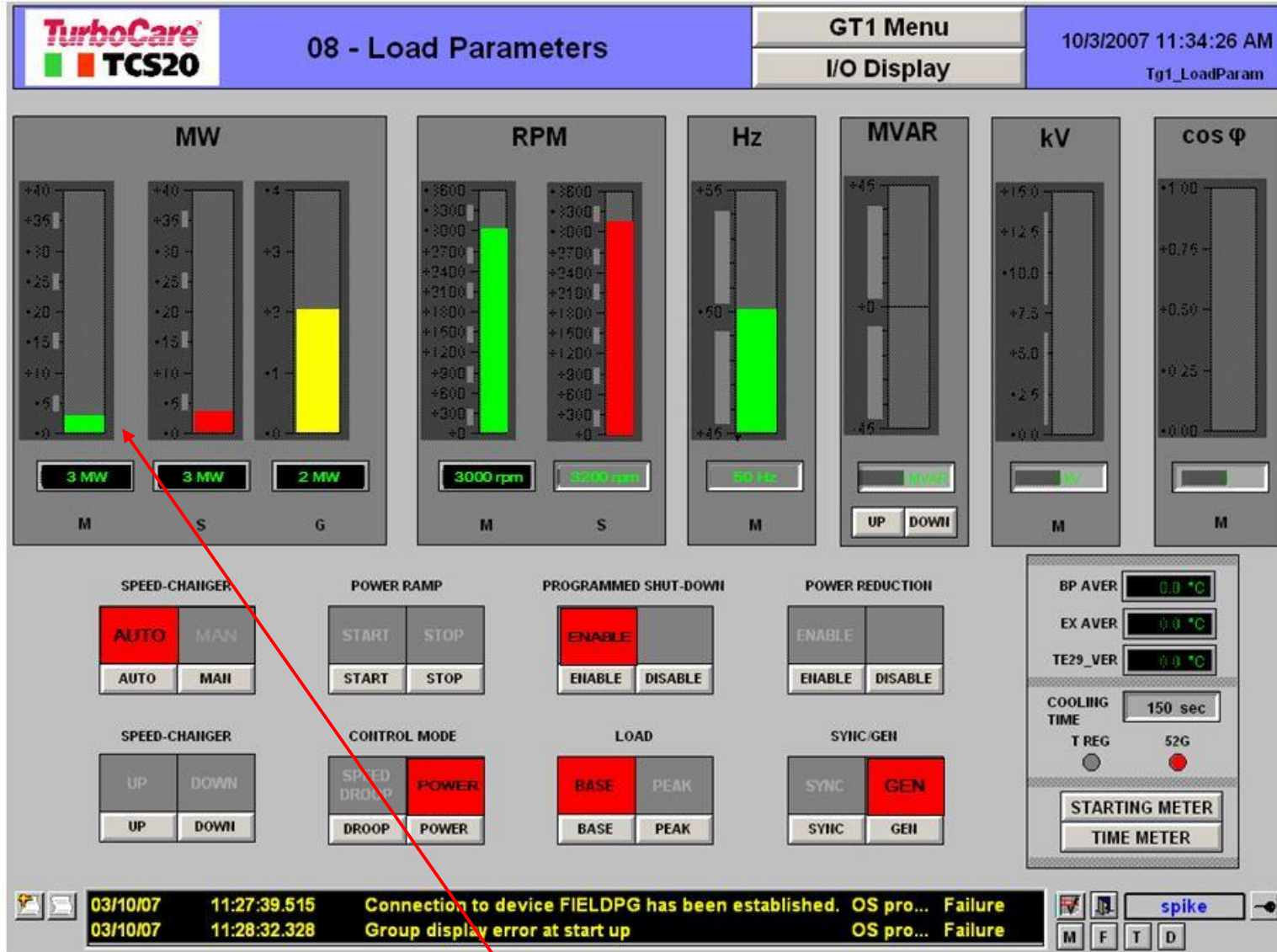
يتم تحويل نظام التحكم تلقائياً من التحكم في SPEED DROOP إلى التحكم في POWER



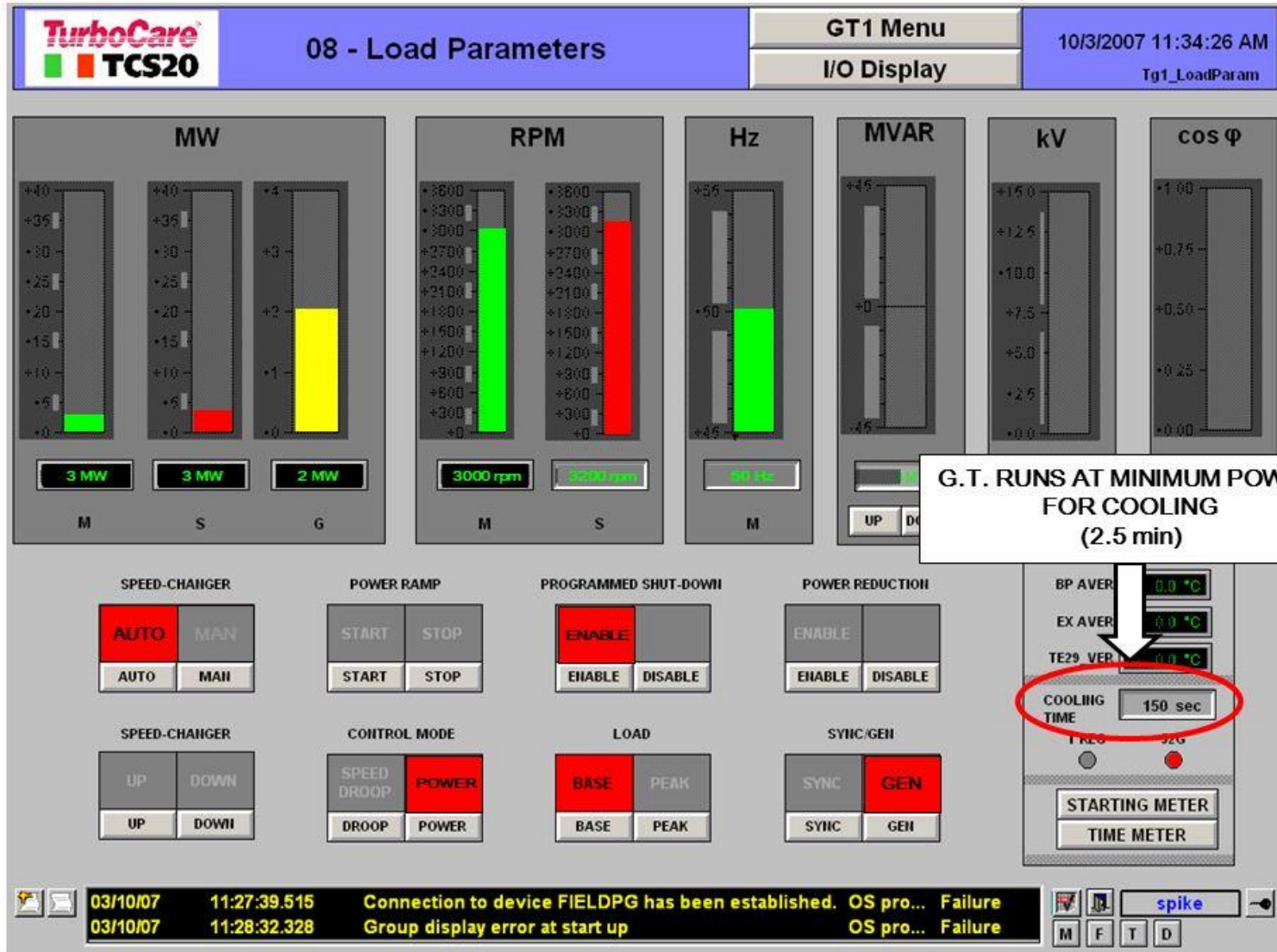


يتم تحويل إعداد (ضبط SET) القدرة الفعالة Active power تلقائياً من القدرة الفعلية Actual power إلى (٣ ميكاواط)

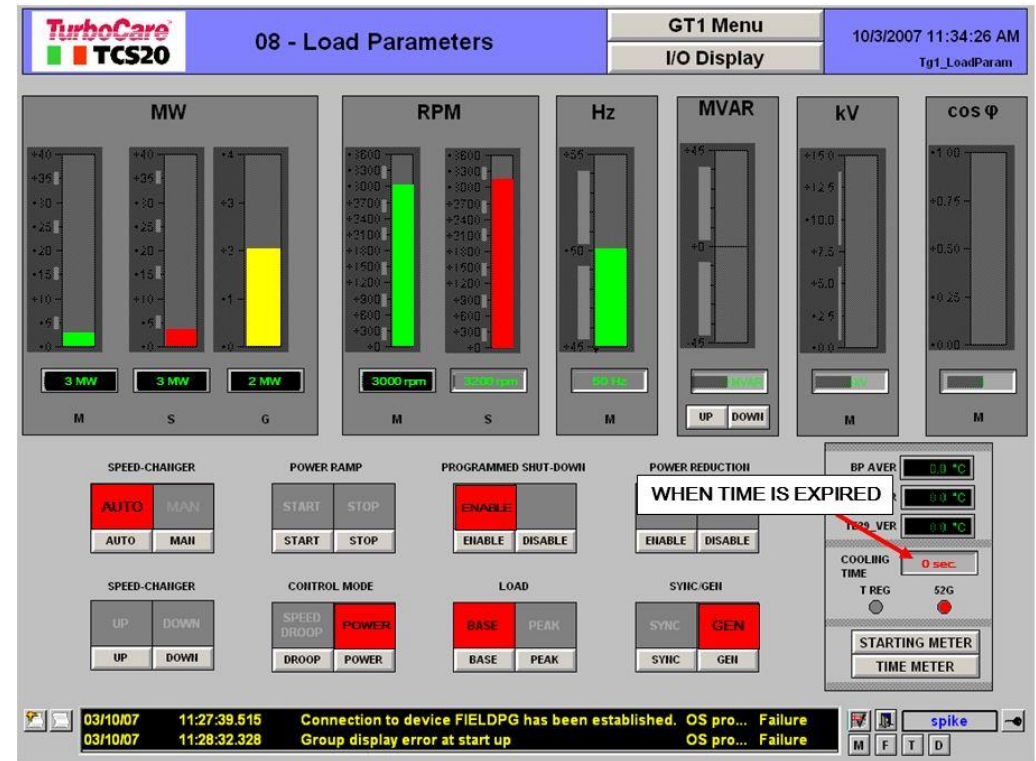
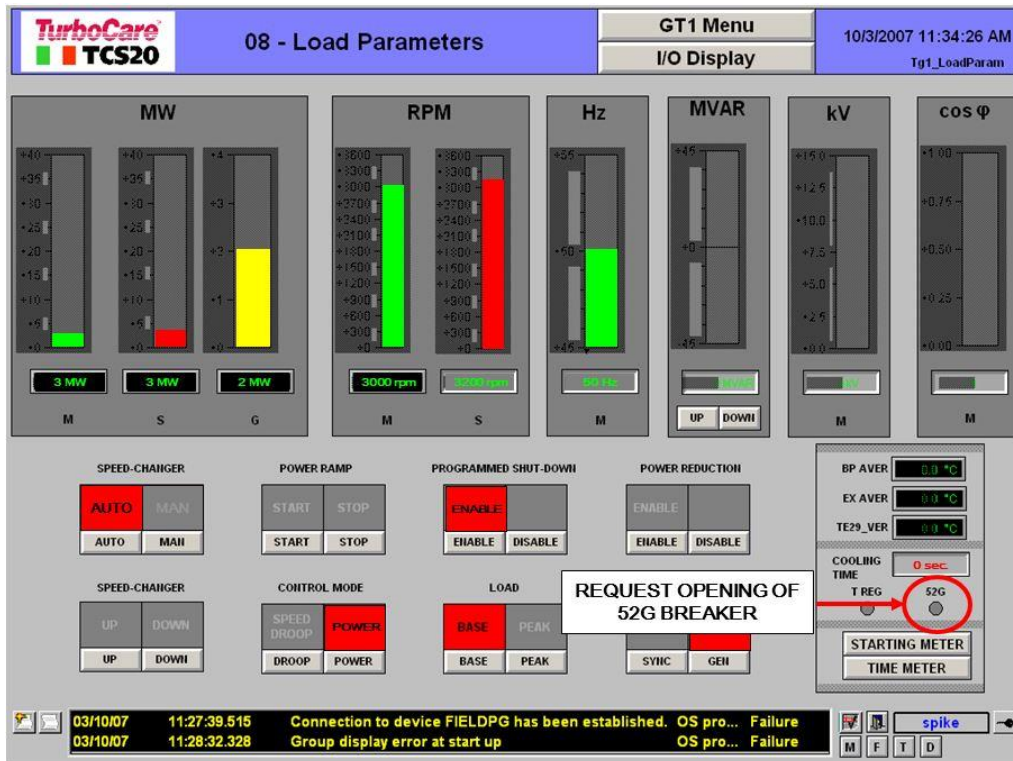




نزول ميل الحمل LOAD RAMP DECREASE . يتم تخفيض الحمل كدالة لمعدل تدرج الحمل Gradient load rate : ( ٢ ميكرواط \ دقيقة MW/min )  
 ( يكون الوقت الافتراضي Default time : xx min من ١٠٠ % إلى ٥ % من الحمل )

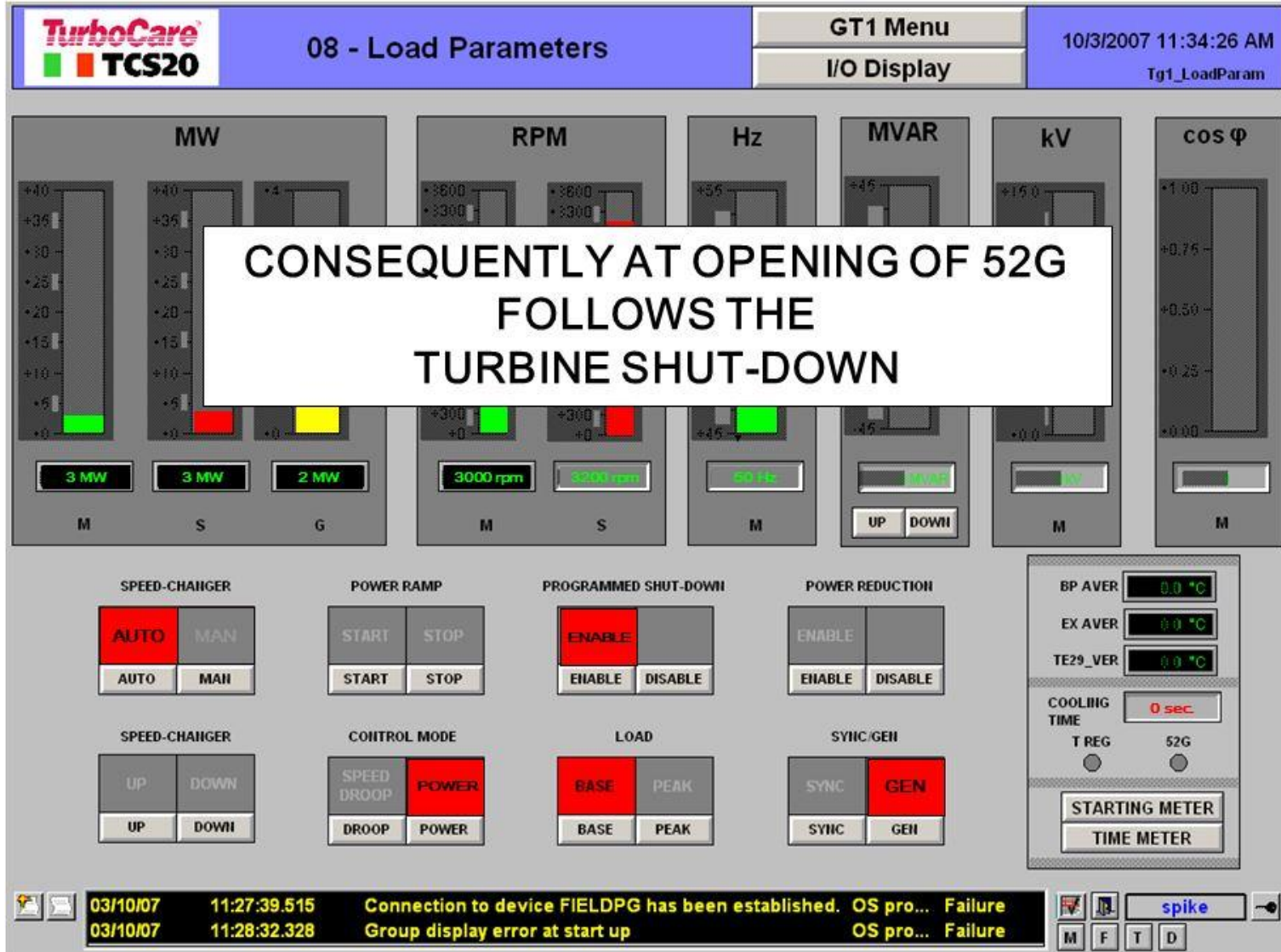


يتم تشغيل الماكينة (التوربين الغازي G.T.) عند أدنى حمل لمدة (٢,٥ دقيقة minutes) لغرض التبريد



عند انتهاء الوقت ، فإن إنتهاء وقت عملية إيقاف التشغيل SHUT-DOWN TIME END يتطلب فتح قاطع الدورة (52G) Circuit Breaker





نتيجة لذلك عند فتح قاطع الدورة (52G) ستعقب عملية إيقاف تشغيل التوربين ، عملية إعادة ضبط التوربين (الرجوع إلى الوضع الأصلي للتوربين MASTER TURBINE is RESET) ويتم حث التوربين على التوقف



- الإيقاف الطارئ أو الإضطراري : EMERGENCY SHUT-DOWN

في حالة التحقق من ظروف التوقف الإضطراري للتوربين Turbine Emergency Stop يمكن للمشغل أن يعمل على الأوامر التالية :

**TurboCare TCS20**  
02 - Starting Sequence  
GT1 Menu  
I/O Display  
10/3/2007 11:31:23 AM  
Tg1\_StartSeq

TCS SELECTORS IN AUTO	M.C.C. CORSEHT	STARTING DIESEL CORSEHT	COMBUSTIBLE CORSEHT	BY-PASS VALVES OPEN	TURBINE GEAR MOTOR RUNNING	S55 CLUTCH ENGAGED	LUBR. OIL TEMP. CORSEHT	PS7	PROTECTION CORSEHT	STARTING CORSEHT
STARTING DIESEL IN OPEARATION	PS6	PS7B	SPOK-PLUGS COMMAHD	XV1	FD1	FD2	FD3	FD4	BY-PASS VALVES CLOSED	STARTING EHD

DRABBING GAS CONDERSATE

SPEED CHANGE: AUT, MAN, MAN

EMERGENCY OIL: ON, OFF

STOP TURBINE: STOP

GENERATOR SPEED: 0 rpm  
ACTIVE POWER: 0 MW  
EXHAUST TEMPERATURE: 0 °C

03/10/07 11:27:39.515 Connection to device FIELDPG has been established. OS pro... Failure  
03/10/07 11:28:32.328 Group display error at start up OS pro... Failure



زر ضغط الطوارئ EMERGENCY PUSH BUTTON على لوحة كابينة التوربين Turbine Cabinet Panel

زر ضغط أمر الإيقاف STOP TURBINE COMMAND في (صفحة الفيديو ٢)

## **صفحة الإنذارات أو التحذيرات - قائمة الإنذارات النشطة : ALARMS PAGE – ACTIVE ALARM LIST**

- الإنذارات أو الإشارات التحذيرية تُعلم أو تُنبه المُشغل عن العيوب والأخطاء MALFUNCTIONS AND ERRORS التي تحدث في العملية .
- أنها تساعد على الكشف عن الحالات الحرجة في وقت مبكر وتجنب إطالة فترات التوقف .
- يتكون نظام الإنذار ALARM SYSTEM من شكل أو بنية وفترة تشغيل GONFIGURATION AND RUNTIME المكونات .

**TurboCare**  
**TCS20**

**Active Alarm List**

TG1 Menu  
I/O Display

10/25/2007 10:31:44 AM  
@AlarmNew\_1

Active alarm list

...	Date	Time	Event	Class	Type	Source
1	25/10/07	10:29:11.531	Group display error at start up	OS proces	Failure	SIMATIC
2	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC
3	25/10/07	10:28:12.843	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC
4	25/10/07	10:28:10.781	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC
5	25/10/07	10:28:10.781	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC
6	25/10/07	10:28:10.781	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC
7	25/10/07	10:28:10.781	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC
8	25/10/07	10:28:10.781	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC
9	25/10/07	10:28:10.781	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC
10	25/10/07	10:28:10.781	Connection error to device TG1.	OS proces	Failure	SIMATIC

10/25/2007 10:31 List: 10 Window: 10 Ack: 10

25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS pro...	Failure	SPIKE
25/10/07	10:29:11.531	Group display error at start up	OS pro...	Failure	M F T D

الصفحة الرئيسية لقائمة الإنذارات أو التحذيرات النشطة ACTIVE ALARM LIST

**TurboCare** **TCS20** **Active Alarm List** **TG1 Menu** **I/O Display** 10/25/2007 10:31:44 AM @AlarmNew\_1

Active alarm list

...	Date	Time	Event	Class	Type	Source
1	25/10/07	10:29:11.531	Group display error at start up	OS proces	Failure	SIMATIC
2	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC
3	25/10/07	10:28:12.843	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC
4	25/10/07	10:28:10.781	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC
5	25/10/07	10:28:10.781	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC
6	25/10/07	10:28:10.781	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC
7	25/10/07	10:28:10.781	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC
8	25/10/07	10:28:10.781	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC
9	25/10/07	10:28:10.781	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC
10	25/10/07	10:28:10.781	Connection error to device TG1.	OS proces	Failure	SIMATIC

DATE OF INTERVENTION      TIME OF INTERVENTION      TYPE OF EVENT

10/25/2007 10:31 List: 10 Window: 10 Ack: 10

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
 25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

M F T D SPIKE

تاريخ ووقت حدوث التداخل INTERVENTION ونوع الحدث أو الحادثة EVENT



إقرار أو تأكيد صحة كل الرسائل المرئية  
**ACKNOWLEDGE ALL VISIBLE MESSAGES**

رسالة إشعار  
**ACKNOWLEDGE MESSAGE**



**Active Alarm List**

TG1 Menu

I/O Display

10/25/2007 10:31:44 AM

@AlarmNew\_1

Active alarm list

...	Date	Time	Event	Class	Type	Source
1	25/10/07	10:29:11.531	Group display error at start up	OS proces	Failure	SIMATIC
2	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC
3	25/10/07	10:28:12.843	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC
4	25/10/07	10:28:10.781	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC
5	25/10/07	10:28:10.781	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC
6	25/10/07	10:28:10.781	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC
7	25/10/07	10:28:10.781	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC
8	25/10/07	10:28:10.781	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC
9	25/10/07	10:28:10.781	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC
10	25/10/07	10:28:10.781	Connection error to device TG1.	OS proces	Failure	SIMATIC

التمرير الذاتي (تفعيل | إلغاء تفعيل)  
**AUTOSCROLLING  
 ACTIVATE/DEACTIVATE**

10/25/2007 10:31 List: 10 Window: 10 Ack: 10

25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS pro...	Failure	SPIKE
25/10/07	10:29:11.531	Group display error at start up	OS pro...	Failure	M F T D



## Active Alarm List

TG1 Menu

I/O Display

10/25/2007 10:31:44 AM

@AlarmNew\_1

Active alarm list

...	Date	Time	Event	Class	Type	Source
1	25/10/07	10:29:11.531	Group display error at start up	OS proces	Failure	SIMATIC
2	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC
3	25/10/07	10:28:12.843	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC
4	25/10/07	10:28:10.781	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC
5	25/10/07	10:28:10.781	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC
6	25/10/07	10:28:10.781	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC
7	25/10/07	10:28:10.781	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC
8	25/10/07	10:28:10.781	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC
9	25/10/07	10:28:10.781	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC
10	25/10/07	10:28:10.781	Connection error to device TG1.	OS proces	Failure	SIMATIC

طباعة الرسالة  
**PRINT MESSAGE**

عرض أو إظهار الرسائل  
**DISPLAY MESSAGES:**

- FIRST      الأولى
- LAST      الأخيرة
- NEXT      القادمة
- PREVIOUS      السابقة

فتح رسالة نص المعلومات  
**OPEN INFO-TEXT MESSAGE**

10/25/2007 10:31 List: 10 Window: 10 Ack: 10

	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS pro...	Failure	
	25/10/07	10:29:11.531	Group display error at start up	OS pro...	Failure	

SPIKE

M F T D

صفحة الإنذارات أو التحذيرات - قائمة الإنذارات المؤرخة (السابقة) : ALARMS PAGE – HISTORIAN ALARM LIST

TurboCare		Historian Alarm List		TG1 Menu		10/25/2007 10:32:14 AM	
TCS20				I/O Display		@AlarmHist_1	
Historian alarm list							
...	Date	Time	Event	Class	Type	Source	
1	25/10/07	10:29:11.531	Group display error at start up	OS proces	Failure	SIMATIC	
2	25/10/07	10:28:15.593	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC	
3	25/10/07	10:28:12.843	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC	
4	25/10/07	10:28:10.781	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC	
5	25/10/07	10:28:10.781	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC	
6	25/10/07	10:28:10.781	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC	
7	25/10/07	10:28:10.781	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC	
8	25/10/07	10:28:10.781	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC	
9	25/10/07	10:28:10.781	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC	
10	25/10/07	10:28:10.781	Connection error to device TG1.	OS proces	Failure	SIMATIC	
11	25/10/07	09:57:44.296	Group display error at start up	OS proces	Failure	SIMATIC	
12	25/10/07	09:56:52.828	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC	
13	25/10/07	09:56:45.703	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC	
14	25/10/07	09:56:43.343	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC	
15	25/10/07	09:56:43.343	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC	
16	25/10/07	09:56:43.343	Connection error to device CLIENT3.	OS proces	Failure	SIMATIC	
17	25/10/07	09:56:43.343	Connection error to device CLIENT4.	OS proces	Failure	SIMATIC	
18	25/10/07	09:56:43.343	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC	
19	25/10/07	09:56:43.343	Connection error to device SRVGRPH1.	OS proces	Failure	SIMATIC	
20	25/10/07	09:56:43.343	Connection error to device TG1.	OS proces	Failure	SIMATIC	
21	03/10/07	17:12:46.796	Connection error to device FIELDPG.	OS proces	Failure	SIMATIC	
22	03/10/07	11:28:32.328	Group display error at start up	OS proces	Failure	SIMATIC	
23	03/10/07	11:27:39.515	Connection to device FIELDPG has been established.	OS proces	Failure	SIMATIC	
24	03/10/07	11:27:33.218	LAN sync: Cannot acquire time from the connected Win	OS proces	Failure	SIMATIC	
25	03/10/07	11:27:30.531	Connection error to device CLIENT1.	OS proces	Failure	SIMATIC	
26	03/10/07	11:27:30.531	Connection error to device CLIENT2.	OS proces	Failure	SIMATIC	

قائمة الإنذارات المؤرخة تعرض جميع الرسائل ، النشطة وغير النشطة ، المخزونة في قائمة المحفوظات أو الأرشيف

الصفحة الرئيسية لقائمة الإنذارات أو التحذيرات المؤرخة  
HISTORIAN ALARM LIST



## صفحة التوقفات : TRIP PAGE

**TurboCare TCS20** GT1 FIFO GT1 Menu I/O Display 10/25/2007 10:29:42 AI Tg1\_LoadParam

<input type="radio"/> LIQUID FUEL PRESSURE LOW	<input type="radio"/> GENERATOR TRIP
<input checked="" type="radio"/> STARTING DIESEL FAILURE	<input type="radio"/> FIRE
<input type="radio"/> FUEL OIL INJECTION PUMP PRESSURE	<input type="radio"/> IGNITION FAILURE
<input type="radio"/> LUBE OIL PRESSURE LOW	<input type="radio"/> FUEL OIL INJECTION PUMP PROTECTION
<input type="radio"/> COOLER OUTLET LUBRICATING OIL TEMP. VERY HIGH	<input type="radio"/> FUEL GAS PRESSURE LOW
<input checked="" type="radio"/> STARTING FUEL OIL PRESSURE HIGH	<input checked="" type="radio"/> GAS CONDENSATE HIGH LEVEL
<input type="radio"/> EXCESSIVE VIBRATIONS	<input type="radio"/> SHUT DOWN ON GAS TREATMENT PLANT
<input type="radio"/> FIRE FIGHTING TURBINE TRIP	<input type="radio"/> BABBIT METAL TEMPERATURE VERY HIGH
<input type="radio"/> EXPLOSIVE MIXTURE TURBINE TRIP	<input type="radio"/> EXHAUST MANIFOLD TEMPERATURE VERY HIGH
<input type="radio"/> MECHANICAL OVERSPEED	<input type="radio"/> BLADE PATH TEMP VERY HIGH
<input type="radio"/> INCOMPLETE SEQUENCE	<input type="radio"/> PICK UPS 1 AND 2 FAILURE
<input type="radio"/> SPEED FAILURE	<input type="radio"/> EMERGENCY PUSH BUTTON

ACK RESET

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE M F T D

← الصفحة الرئيسية للتوقفات  
FIFO TRIP

### ملاحظة توضيحية :

**FIFO** : هي اختصار لعبارة ( First Input, First Output ) وتعني (إدخال أول ، إخراج أول) وهي طريقة لتنظيم ومعالجة التخزين المؤقت للبيانات Data buffer ، حيث تتم أولاً وحسب الترتيب معالجة الإدخال الأقدم (الأول) أو رأس قائمة البيانات (الأوامر Commands) .



**TurboCare**  
**TCS20**

**GT1 FIFO**

**GT1 Menu**  
**I/O Display**

10/25/2007 10:29:42 AM  
Tg1\_LoadParam

- LIQUID FUEL PRESSURE LOW
- STARTING DIESEL FAILURE**
- FUEL OIL INJECTION PUMP PROTECTION
- LUBE OIL PRESSURE LOW
- COOLER OUTLET LUBRICATING OIL TEMP. VERY HIGH
- STARTING FUEL OIL PRESSURE HIGH**
- EXCESSIVE VIBRATIONS
- FIRE FIGHTING TURBINE TRIP
- EXPLOSIVE MIXTURE TURBINE TRIP
- MECHANICAL OVERSPEED
- INCOMPLETE SEQUENCE
- SPEED FAILURE

- GENERATOR TRIP
- FIRE
- IGNITION FAILURE
- FUEL OIL INJECTION PUMP PROTECTION
- FUEL GAS PRESSURE LOW
- GAS CONDENSATE HIGH LEVEL**
- SHUT DOWN ON GAS TREATMENT PLANT
- BABBIT METAL TEMPERATURE VERY HIGH
- EXHAUST MANIFOLD TEMPERATURE VERY HIGH
- BLADE PATH TEMP VERY HIGH
- PICK UPS 1 AND 2 FAILURE
- EMERGENCY PUSH BUTTON

**ACTIVE CAUSES OF PROTECTIONS**

ACK      RESET

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure

25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE

M F T D

اسباب تنشيط أو تفعيل الحماية PROTECTIONS

**TurboCare**  
TCS20

**GT1 FIFO**

GT1 Menu  
I/O Display

10/25/2007 10:29:42 AM  
Tg1\_LoadParam

- LIQUID FUEL PRESSURE LOW
- STARTING DIESEL FAILURE**
- FUEL OIL INJECTION PUMP PRESSURE
- LUBE OIL PRESSURE LOW
- COOLER OUTLET LUBRICATING OIL TEMP. VERY HIGH
- STARTING FUEL OIL PRESSURE HIGH**
- EXCESSIVE VIBRATIONS
- FIRE FIGHTING TURBINE TRIP
- GENERATOR TRIP
- FIRE
- IGNITION FAILURE
- FUEL OIL INJECTION PUMP PROTECTION
- FUEL GAS PRESSURE LOW
- GAS CONDENSATE HIGH LEVEL**
- SHUT DOWN ON GAS TREATMENT PLANT
- BABBIT METAL TEMPERATURE VERY HIGH
- TEMPERATURE VERY HIGH
- RY HIGH
- URE
- SPEED FAILURE
- EMERGENCY PUSH BUTTON

ACK RESET

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE M F T D

**LOGIC FIFO (FIRST INPUT FIRST OUTPUT) :  
THE FIRST CAUSE OF BLOCK INTERVENED  
IS UNDERLINED IN RED**

منطق أو برمجة FIFO : يتم التأكيد باللون الأحمر على السبب الأول للتوقف (العائق المتداخل)

**TurboCare** **TCS20** **GT1 FIFO** **GT1 Menu** **I/O Display** 10/25/2007 10:29:42 AM  
Tg1\_LoadParam

<input type="radio"/> LIQUID FUEL PRESSURE LOW	<input type="radio"/> GENERATOR TRIP
<input checked="" type="radio"/> STARTING DIESEL FAILURE	<input type="radio"/> FIRE
<input type="radio"/> FUEL OIL INJECTION PUMP PRESSURE	<input type="radio"/> IGNITION FAILURE
<input type="radio"/> LUBE OIL PRESSURE LOW	<input type="radio"/> FUEL OIL INJECTION PUMP PROTECTION
<input type="radio"/> COOLER OUTLET LUBRICATING OIL TEMP. VERY HIGH	<input type="radio"/> FUEL GAS PRESSURE LOW
<input checked="" type="radio"/> STARTING FUEL OIL PRESSURE HIGH	<input checked="" type="radio"/> GAS CONDENSATE HIGH LEVEL
<input type="radio"/> EXCESSIVE VIBRATIONS	<input type="radio"/> SHUT DOWN ON GAS TREATMENT PLANT
<input type="radio"/> FIRE FIGHTING TURBINE TRIP	<input type="radio"/> BABBIT METAL TEMPERATURE VERY HIGH
<input type="radio"/> INCOMPLETE SEQUENCE	<input type="radio"/> PICK UPS 1 AND 2 FAILURE
<input type="radio"/> SPEED FAILURE	<input type="radio"/> EMERGENCY PUSH BUTTON

**WITH ACKNOWLEDGE BUTTON  
DISAPPEAR THE RED LINE OF FIRST CAUSE OF TRIP**

**ACK** **RESET**

25/10/07 10:28:15.593 Connection to device FIELDPS has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE M F T D

مع زر الإقرار أو التأكيد ACK ، يختفي الخط أو السطر الأحمر لسبب التوقف الأول

**TurboCare**  
TCS20

**GT1 FIFO**

GT1 Menu  
I/O Display

10/25/2007 10:29:42 AM  
Tg1\_LoadParam

- LIQUID FUEL PRESSURE LOW
- STARTING DIESEL FAILURE
- FUEL OIL INJECTION PUMP PRESSURE
- LUBE OIL PRESSURE LOW
- COOLER OUTLET LUBRICATING OIL TEMP. VERY HIGH
- STARTING FUEL OIL PRESSURE HIGH
- EXCESSIVE VIBRATIONS
- FIRE FIGHTING TU
- EXPLOSIVE MIXTU
- MECHANICAL OVE
- INCOMPLETE SEQUENCE
- SPEED FAILURE
- GENERATOR TRIP
- FIRE
- IGNITION FAILURE
- FUEL OIL INJECTION PUMP PROTECTION
- FUEL GAS PRESSURE LOW
- GAS CONDENSATE HIGH LEVEL
- SHUT DOWN ON GAS TREATMENT PLANT
- UPS 1 AND 2 FAILURE
- EMERGENCY PUSH BUTTON

**WITH RESET BUTTON  
DISAPPEAR THE RED CIRCLE OF TRIP  
ONLY IF THE PROTECTION CAUSES ARE REENTERED**

ACK RESET

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE M F T D

مع زر إعادة الضبط RESET ، تختفي الدائرة الحمراء للتوقف فقط في حالة تكرار سبب الحماية



## صفحة التشخيص - الإدخال \ الإخراج : DIAGNOSTIC PAGE – INPUT/OUTPUT

توفر صفحة تشخيص المدخلات والمخرجات Input-Output Diagnostic page طريقة للتحكم في نقاط المراقبة Monitoring Points ونقاط التحكم Control Points في النظام وتشخيصها ( لتغيير كيفية عمل الجهاز أو للمساعدة في أستكشاف الأخطاء وإصلاحها) تتيح لك صفحة تشخيص المدخلات والمخرجات رؤية الأوامر Commands التي يتم إرسالها وإستلامها من وحدة التحكم Controller . بينما يتم تشفير Encoded العديد من هذه الأوامر ويصعب فهمها ، فقد يكون من الضروري مراقبة الاتصال من وإلى وحدة التحكم . يحتوي الجانب الأيسر على الأوامر التي يتم إرسالها إلى وحدة التحكم . كافة الأوامر التي نراها تكون مشفرة لوحدة التحكم . على الجانب الأيمن ، نرى كل الإستجابات من وحدة التحكم .

**TurboCare**  
**TCS20**

**Diagnostic**

**GT1 Menu**  
**I/O Display**

10/25/2007 10:30:52 AM  
Tg1\_DiagnProfib.

**CPU400 4H/0**

**CPU400 4H/1**

**PROFIBUS 1**

**PROFIBUS 2**

**BUS 1A**  
IM 169-2 IM 169-2 DI 0 DI 2 DI 4 DI 6 DI 8 DI 10 AI 11 AI 121

**BUS 2B**  
IM 169-2 IM 169-2 DI 12 DI 14 DI 16 DI 18 DI 20 DI 22 AI 14 AI 161

**BUS 3**  
IM 169-2 IM 169-2 DI 0 DI 4 DI 8 AI 11 AI 21

**BUS 4A**  
IM 169-2 IM 169-2 AI 71 AI 81 AI 91 AI 11 AI 14 AI 16 AI 171

**BUS 5B**  
IM 169-2 IM 169-2 AI 70 AI 72 AI 73 AI 75 AI 76 AI 78 AI 801

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

**SPIKE**

M F T D

الصفحة الرئيسية للتشخيص Diagnostic

**TurboCare**  
**TCS20**

**Diagnostic**

GT1 Menu  
I/O Display

10/25/2007 10:30:52 AM  
Tg1\_DiagnProfib.

**IF ONE OR MORE CARDS ARE IN FAULT  
A RED RECTANGLE APPEAR AROUND THE CARD**

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE

M F T D

إذا كان هناك خلل FAULT في بطاقة واحدة أو أكثر ، سيظهر مستطيل بلون أحمر حول البطاقة

**TurboCare**  
**TCS20**

Diagnostic

GT1 Menu  
I/O Display

10/25/2007 10:30:52 AM  
Tg1\_DiagnProfib.

CLICKING ONTO CARD IN ERROR  
WILL BE DISPLAYED THE CORRESPONDENT  
I/O PAGE WITH ALL THE STATE OF THE SIGNALS

CPU400 4H0

PROFIBUS 1

PROFIBUS 2


25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure  
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE

M F T D

بالنقر فوق البطاقة العاطلة سيتم عرض صفحة المدخلات \ المخرجات (I/O) المتوافقة مع كل حالات الإشارات







# Diagnostic


**GT1 Menu**  
**I/O Display**

10/25/2007 10:30:52 AM  
Tg1\_DiagnProfib.

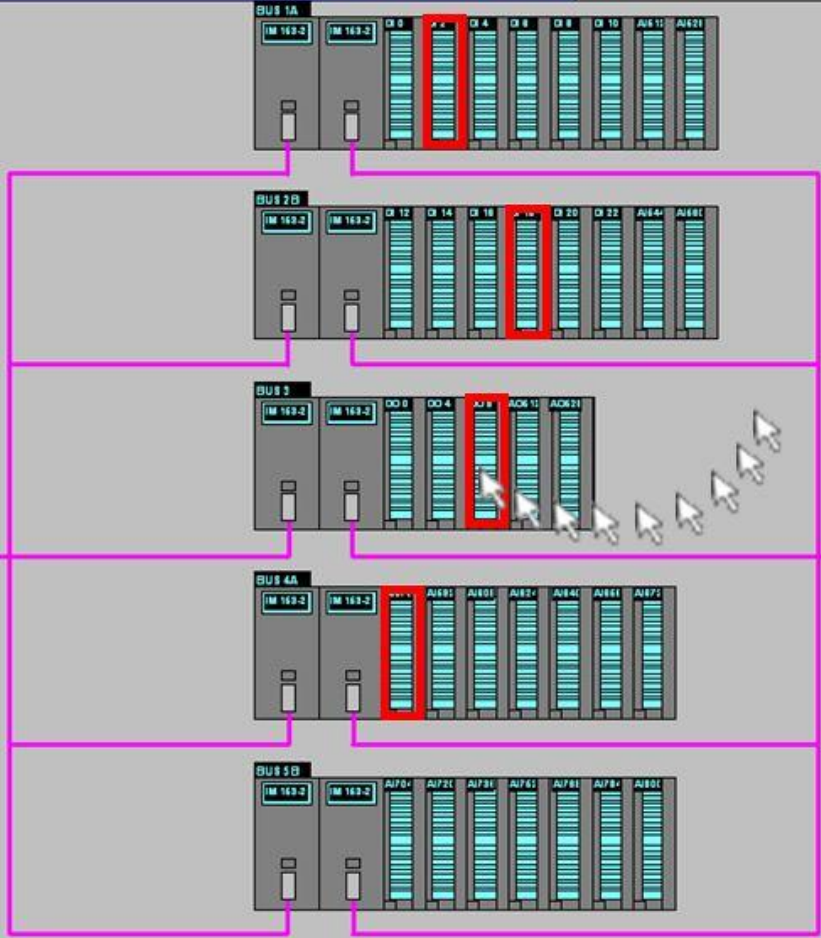




PROFIBUS 1



PROFIBUS 2



25/10/07	10:28:15.593	Connection to device FIELDPG has been established. OS pro... Failure	
25/10/07	10:29:11.531	Group display error at start up	OS pro... Failure

SPIKE

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F

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D

**TurboCare**  
**TCS20**

**Net Diagnostic**

**TG1 Menu**  
**I/O Display**

10/25/2007 10:31:18 AM  
Net Diagnostic

CLIENT1 Disturbed

CLIENT2 Disturbed

CLIENT3 Disturbed

CLIENT4 Disturbed

FIELDPG Established

SRVGRPH1 Disturbed

TG1 Disturbed

25/10/07 10:28:15.593 Connection to device FIELDPG has been established. OS pro... Failure

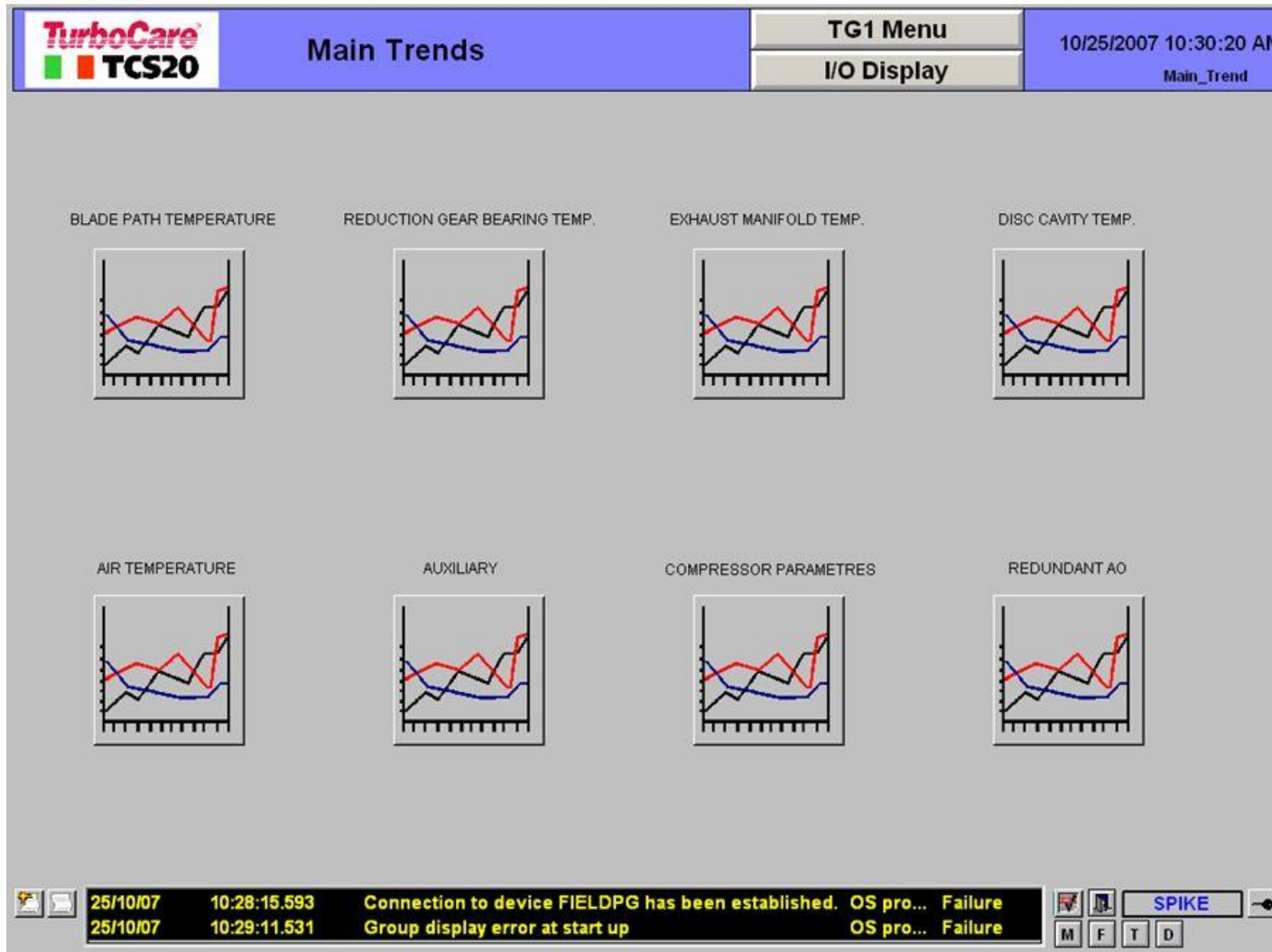
25/10/07 10:29:11.531 Group display error at start up OS pro... Failure

SPIKE

M F T D

صفحة التشخيص – شبكة الإتصال  
(شبكة أجهزة الكمبيوتر لغرض إنتقال المعلومات)

## : MAIN TRENDS PAGE صفحة الإتجاهات أو المسارات الرئيسية



إتجاهات ومسارات التغيير والتحول في الحالات والخواص

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