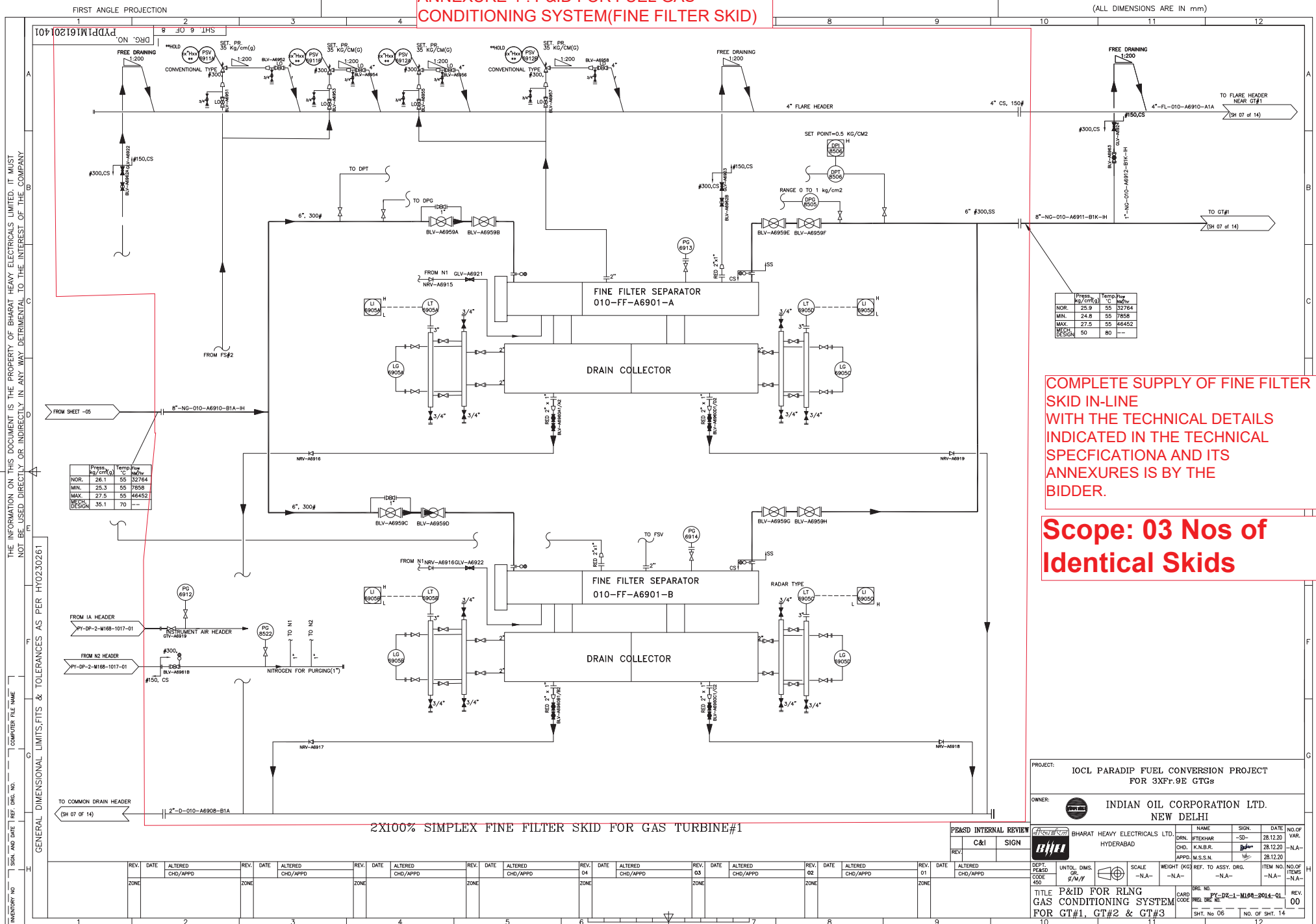


**ANNEXURE-1 : P&ID FOR FUEL GAS  
CONDITIONING SYSTEM(FINE FILTER SKID)**









(ALL DIMENSIONS ARE IN mm)



COMPLETE SUPPLY OF FINE FILTER  
SKID IN-LINE  
WITH THE TECHNICAL DETAILS  
INDICATED IN THE TECHNICAL  
SPECIFICATIONA AND ITS  
ANNEXURES IS BY THE  
BIDDER.

### Scope: 03 Nos of Identical Skids

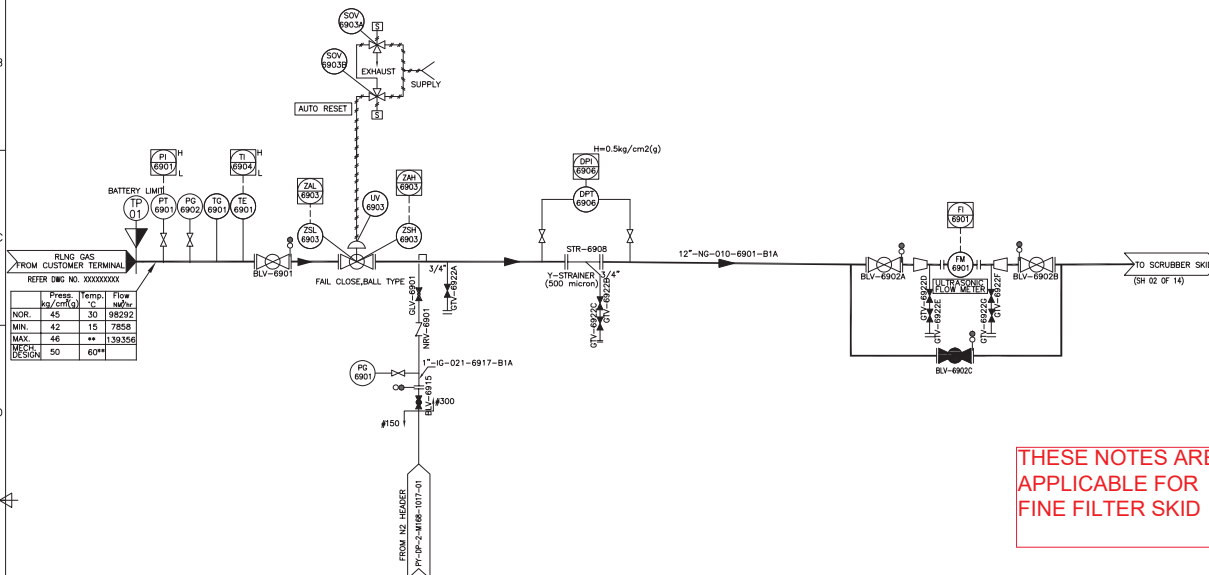
~~2X100% SIMPLEX FINE FILTER SKID FOR GAS TURBINE#1~~

PROJECT: IOCL PARADIP FUEL CONVERSION PROJECT FOR 3XFR.9E GTGs																														
OWNER: 		INDIAN OIL CORPORATION LTD. NEW DELHI																												
		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		<table><tr><td>NAME</td><td>SIGN</td><td>DATE</td></tr><tr><td>SRNL FTECHWAR</td><td>-SD-</td><td>28.12.20</td></tr><tr><td>CHD. K.N.B.R.</td><td></td><td>28.12.20</td></tr><tr><td>APP. M.S.S.N.</td><td></td><td>28.12.20</td></tr></table>		NAME	SIGN	DATE	SRNL FTECHWAR	-SD-	28.12.20	CHD. K.N.B.R.		28.12.20	APP. M.S.S.N.		28.12.20	<table><tr><td>NO. OF VAR.</td></tr><tr><td>-N-A-</td></tr><tr><td>-N-A-</td></tr><tr><td>-N-A-</td></tr></table>		NO. OF VAR.	-N-A-	-N-A-	-N-A-							
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OFFICE	OF		-N-A-	-N-A-	-N-A-	-N-A-	-N-A-																							
CARD NO.																														
TITLE P&ID FOR RING GAS CONDITIONING SYSTEM FOR GT#1, GT#2 & GT#3				CARD NO.		DRG. NO. PY-DZ-1-M104-2014-01		REV. 00		H																				
				SHT. NO 06		NO. OF SHT. 14		12																						

INVENTORY NO	SIGN. AND DATE	REF. DRG. NO.	COMPUTER FILE NAME
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GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

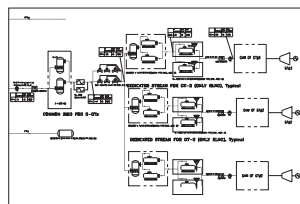
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THESE NOTES ARE  
APPLICABLE FOR  
FINE FILTER SKID

TAG NUMBERING PHILOSOPHY:-

TAG NO. INDEX	TAGS USED	RANGE	SPARE TAGS
EQUIPMENT TAG	---	6901-99	---
LINE NUMBERS	6901-6948	6901-99	---
VALVE TAG.	6901-6963 6969A-6969G	6901-99	---
INST. TAG	6901-6944	6901-99	---
INTERLOCK TAG.	6901-04	6901-99	---



NOTES:- MECHANICAL

1. ACCORDING TO FINAL LAYOUT.
- 1.1 INSTRUMENT ISOLATION VALVES, VENT & DRAIN VALVES ARE OF GATE TYPE AS PER BHEL PIPING MATERIAL SPECIFICATION.
- 1.2 VENTS/DRAINS ARE SHOWN ONLY TO MEET SYSTEM REQUIREMENTS. ADDITIONAL HIGH POINT VENT AND LOW POINT DRAINS SHALL BE PROVIDED.
- 1.3 OPERATOR SHALL INSURE INSTRUMENT AIR SUPPLY BEFORE COMMISSIONING OF VARIOUS SKIDS FOR OPERATION OF THE INSTRUMENT(S) LEVEL CONTROL VALVES/SHUTDOWN/BLOWDOWN/SOLENOID VALVES).
- 1.4 Y-STRAINER OF 500 MICRON ARE PROVIDED AT THE BATTERY LINE FOR ARRESTING PIPE RUST, SCALES ETC., DURING COMMISSIONING. AFTER COMMISSIONING OF THE SYSTEM, FILTER ELEMENTS IN THE STRAINER SHALL BE REMOVED.
- 1.5 NIL
- 1.6 SCRUBBER, FILTER SEPARATOR AND ELECTRIC HEATER SKIDS VESSELS SHALL BE DESIGNED AS ASM ESEC. VII, DIV. 1
- 1.7 (i) OUTLET ISOLATION VALVE OF SAFETY VALVE SHALL BE ALWAYS KEPT OPEN.
- (ii) OUTLET ISOLATION VALVE OF SAFETY VALVE SHALL BE CLOSED ONLY WHEN THE INLET ISOLATION VALVE OF SAFETY VALVE IS CLOSED AND THE SPACE BETWEEN THE SAFETY VALVE AND INLET ISOLATION VALVE IS ADEQUATELY DEPRESSURIZED THROUGH BLEED VALVE.
- (iii) SAFETY VALVE SHALL BE TAKEN FOR MAINTENANCE ONLY AFTER THE SPACE BETWEEN THE INLET VALVE AND SAFETY VALVE AND SPACE BETWEEN SAFETY VALVE AND OUTLET ISOLATION VALVE ARE SAFELY DEPRESSURIZED THROUGH RESPECTIVE BLEED VALVES.
- (iv) SAFETY VALVES IN ALL FLARE/VENT LINES SHALL BE INSTALLED IN HORIZONTAL DIRECTION WITH STEM DOWNWARDS TO AVOID BLOCKAGE OF GATE VALVE.
- 1.7.1 ALL PSVs ARE OF FIRE SAFE CONDITION VALVES AS PER API-520.
- 1.8 FUEL GAS LINE DOWNSTREAM OF FILTER SEPARATOR SKID IS OF STAINLESS STEEL MATERIAL.
- 1.9 ALL VENTS AND DRAINS UPTO FIRST ISOLATION VALVE (NON LO TYPE) SHALL BE OF STAINLESS STEEL MATERIAL FOR SS LINES.
- 1.10 FOR MATERIAL SPECIFICATION OF PIPES, FITTINGS ETC., REFER APPLICABLE PIPING MATERIAL SPECIFICATION.
- 1.11, THIS BUILT VALVE ALONG WITH SPECTACLE BLIND SHALL BE OPENED AFTER ENSURING THAT THE NRV IN THE N2 SYSTEM IS NOT PASSING.
- (i) ANY READING IN THE PRESSURE GAUGE IS RESULT OF PASSING THROUGH NRV.
- 1.12 ALL BALL VALVES IN FUEL GAS SYSTEM ARE OF FULL BORE FIRE SAFE DESIGN ONLY.
- 1.13 THE SCRUBBER SHALL BE OF VERTICAL TYPE. FILTER SEPARATOR SHALL BE HORIZONTAL TYPE.
- 1.14 NIL
- 1.15 NIL
- 1.16 NECESSARY ROOT VALVES, INLET ISOLATION VALVES, VENT/DRAIN VALVES WILL BE PROVIDED FOR PR., DP, FLOW, & LEVEL MEASURING INST.
- 1.17 AS PER APPROVED INSTRUMENT HOOK UP DRAWING.
- 1.17.1 FOR MATERIAL SPECIFICATION OF PIPES, FITTINGS ETC., PLEASE REFER TO APPLICABLE PROJECT PIPING MATERIAL SPECIFICATION.
- 1.18. EL LEGEND SHALL BE FOLLOWED.
- 1.19 NIL
- 1.20. ALL VENTS & DRAINS SHALL BE MINIMUM 3/4" SIZE.
- 1.21. END CONNECTIONS SHOWN IN THIS P&ID IS INDICATED ONLY. HOWEVER THE SAME SHALL BE AS PER PMS. END CONNECTIONS OF CONTROL VALVES SHALL BE AS PER MANUFACTURER'S STANDARD.
- 1.22. COVER JUNCTIONS SHALL BE PROVIDED ACROSS ALL THE FLANGES FOR ELECTRICAL CONDUCTIVITY.
- 1.25. ALL THE CONTROL/ON-OFF VALVES/FLOWMETERS SHALL BE MINIMUM OF 300# RATING.
- 1.26 ALL THE INSTRUMENT AND VALVE TAG NUMBERS SHALL BE PREFIXED WITH NOL 910 AS PER PROJECT TAG NUMBERS PHILOSOPHY.
- 1.27 THE GATE VALVE ALONG WITH THE SPECTICAL BLIND SHALL BE OPENED AFTER ENSURING THAT NRV IN THE N2 SYSTEM IS NOT PASSING .
- ANY READING IN THE PG WILL RESULT THE PASSING THROUGH NRV.
- 1.28 NIL
- 1.29 DRAIN PROVIDED IS FOR MAINTENANCE PURPOSE ONLY. THE DRAIN FROM GAS IS NOT EXPECTED AS THE GAS IS IN HEATED CONDITION.
- 1.30 THE STEM OF GATE VALVE IN FLARE LINE SHALL BE LOCATED IN HORIZONTAL POSITION.

NOTES:- ELECTRICAL AND C&I

- 2.1 VOLTAGE RATING SOLENOID VALVE = 24 V DC, TYPE OF SOLENOID VALVE = UNIVERSAL TYPE
- 2.2 LEVEL TRANSMITTERS ON SCRUBBER VESSELS/FILTER SEPARATOR ARE OF CONTACT RADAR TYPE AND THESE TRANSMITTERS ARE MOUNTED AT SAME ELEVATION.
- 2.3 ELECTRICAL EQUIPMENT AND RELEVANT INSTRUMENTS IN FUEL GAS SYSTEM ARE DESIGNATED TO EXPLOSION PROOF TO ZONE-1 + 2 & GAS GROUP IA/IB AND IB TEMPERATURE CLASS TS MINIMUM. FURTHER,HAZARDOUS AREA CLASSIFICATION TO BE CARRIED OUT FOR GAS GROUPING IA/IB AS PER IS 5572.
- 2.4 SET POINTS FOR SCRUBBER ARE AS FOLLOWS:
  - (A) LAL = 75 MM, (B) LAH = 125 MM, (C) LAI = 225 MM, (D) LAHI = 275 MM, (E) RANGE = 350 MM
- 2.5 SET POINTS FOR FILTER SEPARATOR ARE AS FOLLOWS:
  - (A) LAL = 125 MM, (B) LUH = 175 MM, (C) LAI = 225 MM, (D) RANGE = 350 MM
- 2.6 THE PSV INDICATOR REPRESENTS 1"INLET x 2"OUTLET VALVE WITH 70" TYPE ORIFICE AND SET PRESSURE OF 28 KG/CM2(G).
- 2.7 ALL FIRE SAFE SAFETY VALVES MUST BE DESIGNED AS PER API-520.
- 2.8 NIL
- 2.9 NIL
- 2.10. THE FLOW INSTRUMENT MINIMUM STRAIGHT PIPE DISTANCE (UPSTREAM AND DOWNSTREAM) TO BE FOLLOWED AS PER MANUFACTURER STANDARD.
- 2.11 END CONNECTIONS FOR TAP OFFS TO BE PROVIDED ON PIPING FOR INSTRUMENTS SHALL BE AS FOLLOWS:
  - i) ROOT VALVE ENDING WITH 3/4" SW FOR PRESSURE < 60ksc(g) and 1" SW FOR PRESSURE > 60 ksc(g).
  - ii) 11/2" FLANGED CONNECTION FOR TEMPERATURE
- 2.12 NECESSARY ROOT VALVES, INST. ISOLATION VALVES, VENT/DRAIN VALVES WILL BE PROVIDED FOR PR., DP, FLOW, & LEVEL MEASURING INSTRUMENTS AS PER APPROVED INSTRUMENT HOOK UP DRAWING.
- 2.13 FIRE IN ANY OF THE ABOVE DEFINED AREAS BEING COMMUNICATED BY CO2 GTO FIRE FIGHTING PANEL/DCS TO BOP-PL&V AND ACCORDINGLY, CLOSURE/OPENING OF ON/OFF VALVE AT GT INLET IS BEING IMPLEMENTED BY BOP-PL&V.
- 2.14 NIL
- 2.15. THE INSTRUMENTS IN THIS PROJECT SHALL BE INSTRINSICALLY SAFE AND CERTIFIED TO IEC ZONE-1 GAS GROUP IC, TEMPERATURE CLASS TS MINIMUM
- 2.16. ALL ELECTRICAL MOTORS INSTALLED SHALL BE FLAME PROOF TYPE.

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OWNER: INDIAN OIL CORPORATION LTD. NEW DELHI											
Bharat HEAVY ELECTRICALS LTD. HYDERABAD											
DEPT. PERSO CODE 450		UNTL. DIMS OF 21/5				SCALE -N.A.-		WEIGHT (KG) -N.A.-		REF. TO ASSY. DRG. -N.A.-	
ITEM NO. 450		ITEM NO. 450		ITEM NO. 450		ITEM NO. 450		ITEM NO. 450		ITEM NO. 450	
TITLE P&ID FOR RLNG GAS CONDITIONING SYSTEM FOR GT#1, GT#2 & GT#3											
CARD CODE						DRG. NO. PV-DZ-1-MI06-3041-01 REV. DRG. NO. 00					
SHT. NO. 01						NO. OF SHT. 14					