Procedimento di Valutazione Impatto Ambientale ex art. 23 D.Lgs. 152/2006 e Autorizzazione Unica ex art. 12 D.Lgs. 387/2003

Progetto Parco Solare Fotovoltaico Calapricello Comune di Taranto (TA)

Calcoli Preliminari degli Impianti del Progetto Definitivo Load Flow AC

REDATTO DA / WRITTEN BY

Maurizio Vanti

APPROVATO DA / APPROVED BY

Marco Giannettoni

REVISIONE	N°	DATA/DATE
Prima Emissione	00	Luglio 2022

MARCO GIANNETTONI 21.07.2022 11:11:24 GMT+01:00

TASSARA MARCO 21.07.2022 11:18:01 GMT+01:00

150 kV

CP Lizzano
150 kV

68292 kVA
262,9 A
-100% PF

68292 kVA
262,9 A
-100% PF

RTN
2225 MVAsc

Cavidotto AT
6-1/C 630
AL

0,001 kV Vd,ln

TR
75 MVA
150/30 kV
YNd11

1TR
6-1/C 300
CU

0,001 kV Vd,ln

2TR
6-1/C 300
CU

0,001 kV Vd,ln

34399 kVA
657,2 A
99,52% PF

34399 kVA
657,2 A
99,52% PF

30,22 kV

Quadro principale MT
30 kV

62,5 kVA
1,2 A
84,46% PF

IIB
3-1/C 630
AL

0,098 kV Vd,ln

IIA
3-1/C 630
AL

0,077 kV Vd,ln

IB
3-1/C 630
AL

0,103 kV Vd,ln

IA
3-1/C 630
AL

0,081 kV Vd,ln

TSA
100 kVA
30/0,4 kV
Dyn11
2,5% TapS

0,404 kV

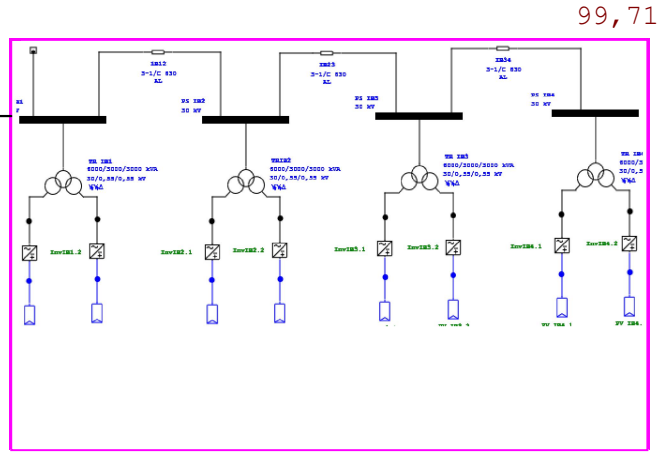
Quadro BT
0,4 kV

61,1 kVA
87,3 A
85% PF

AUX
60 kVA

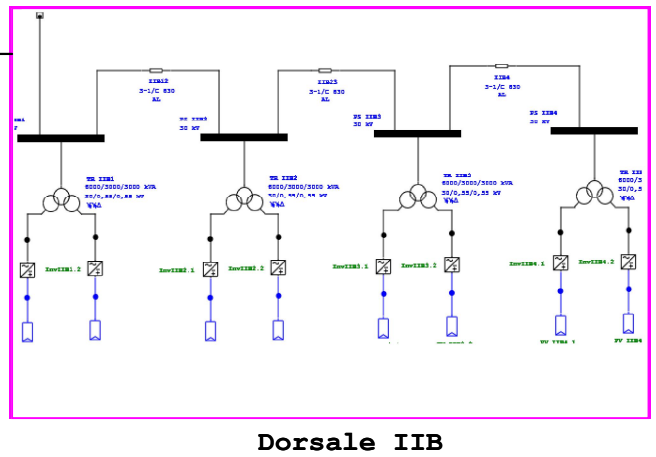
14792 kVA
281,3 A
99,71% PF

19713 kVA
374,4 A
99,77% PF



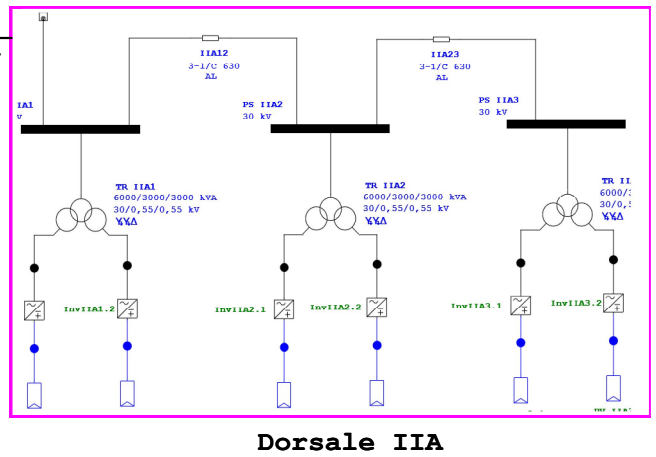
Dorsale IB

19714 kVA
374,5 A
99,78% PF

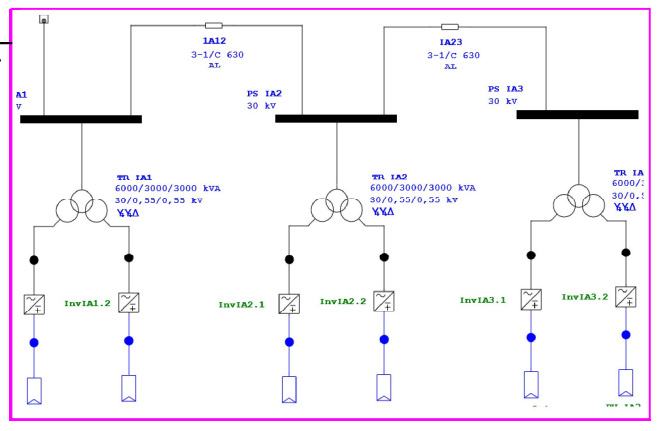


Dorsale IIB

14792 kVA
281,4 A
99,71% PF

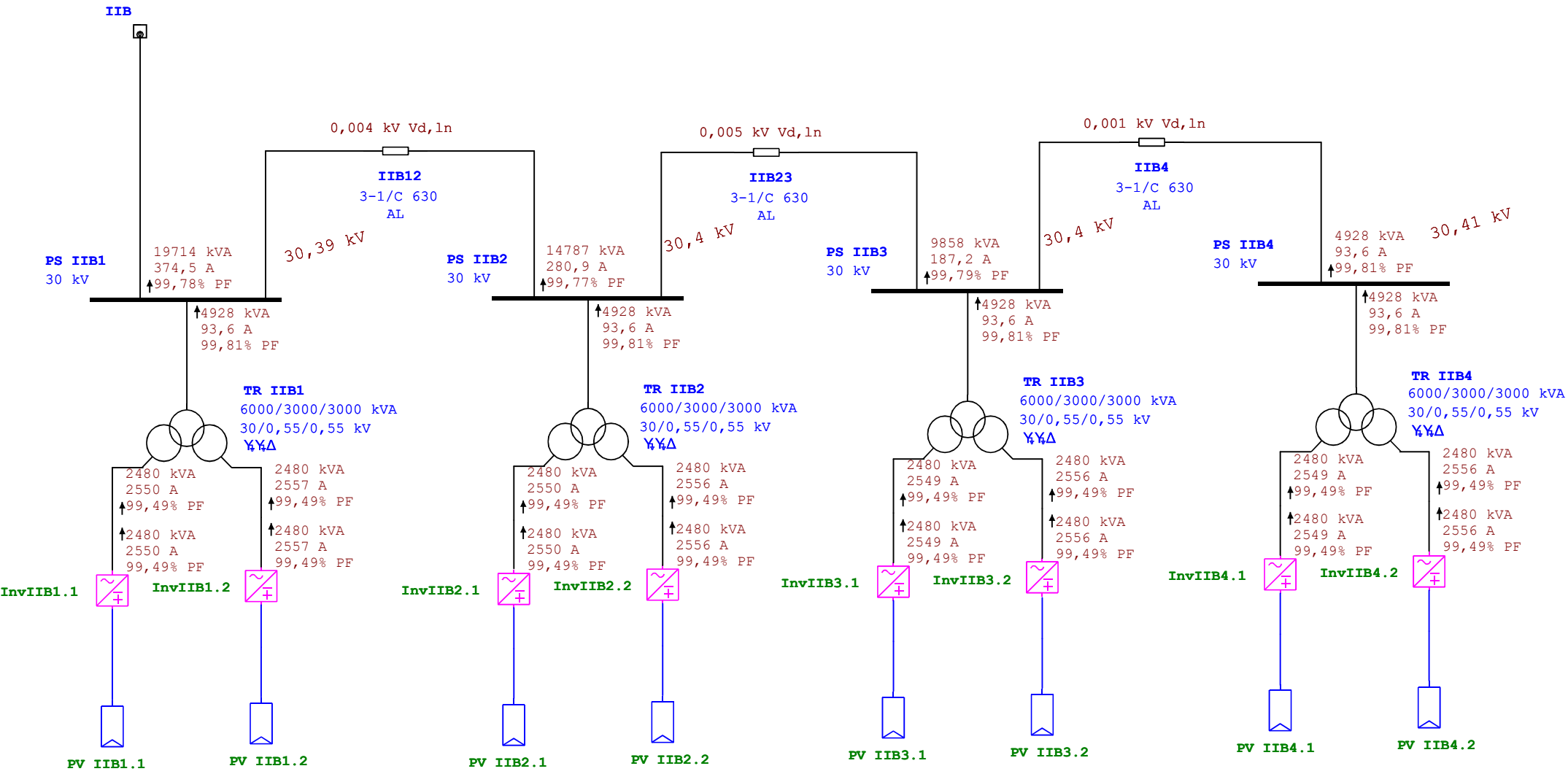


Dorsale IIA

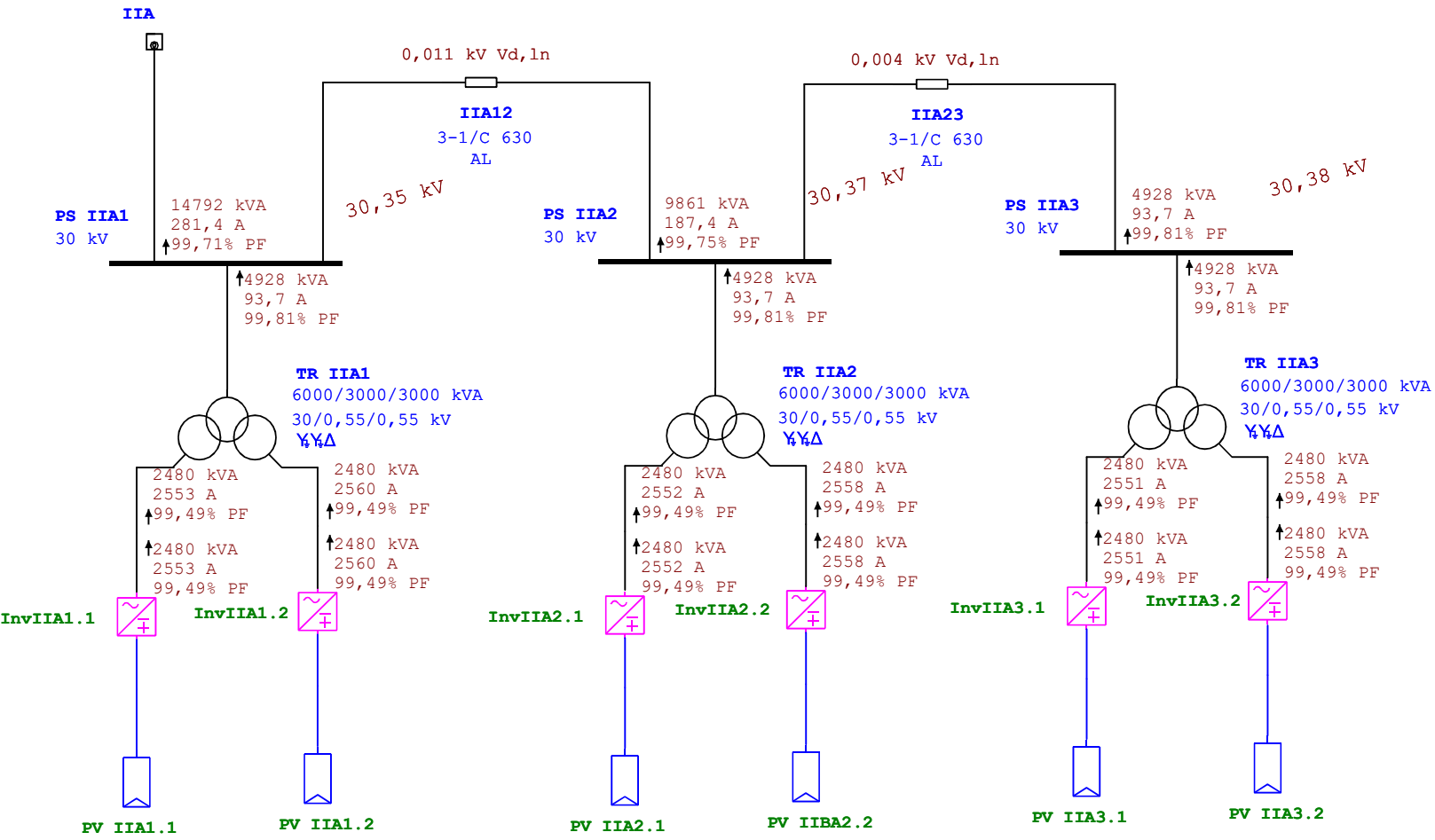


Dorsale IA

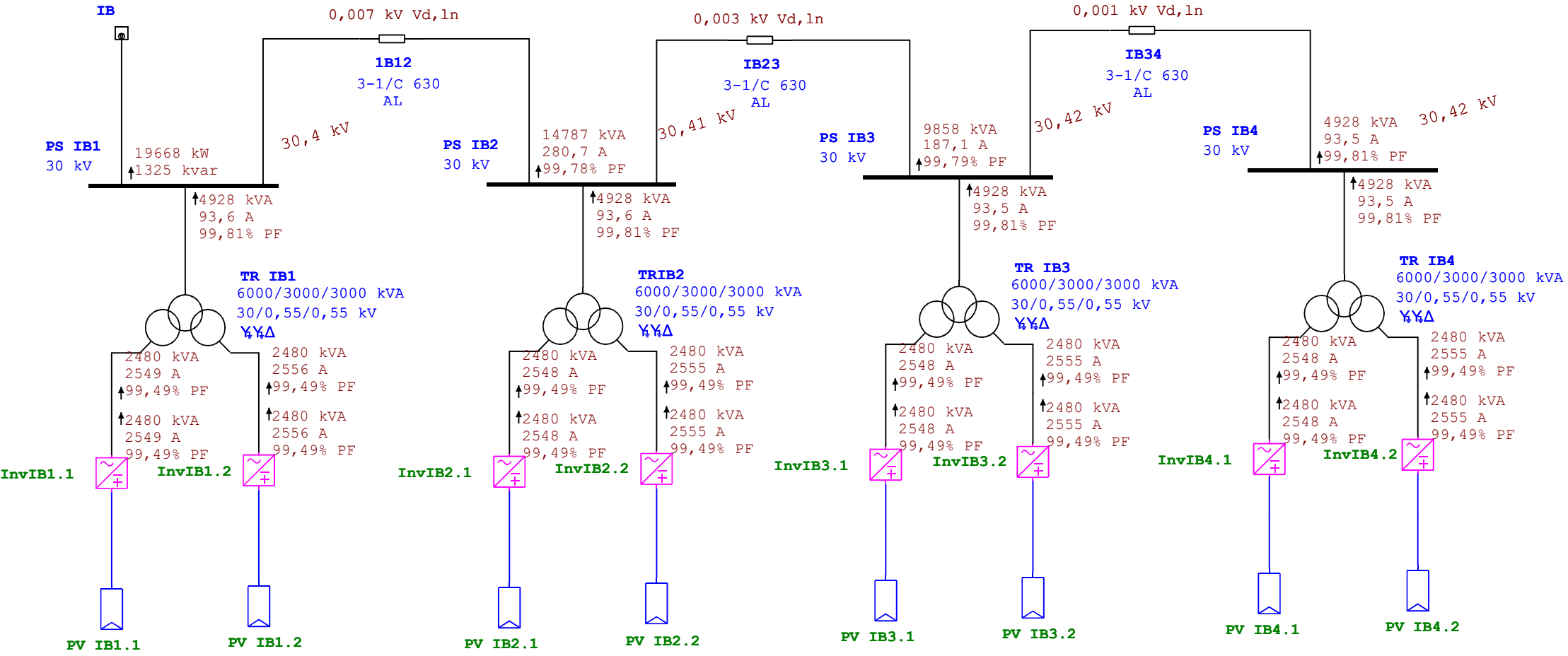
One-Line Diagram - SLD=>Dorsale IIB (Load Flow Analysis)



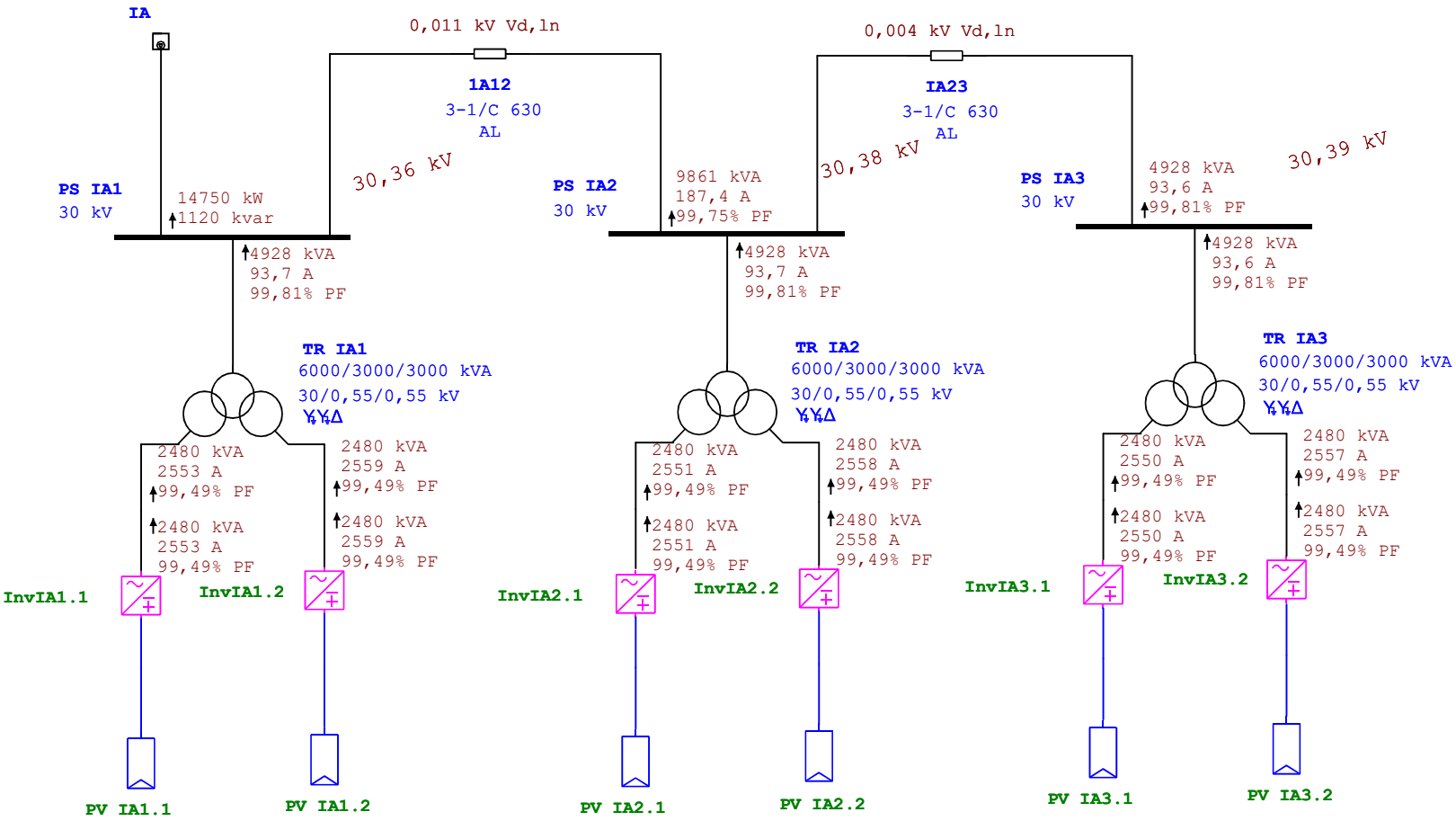
One-Line Diagram - SLD=>Dorsale IIA (Load Flow Analysis)

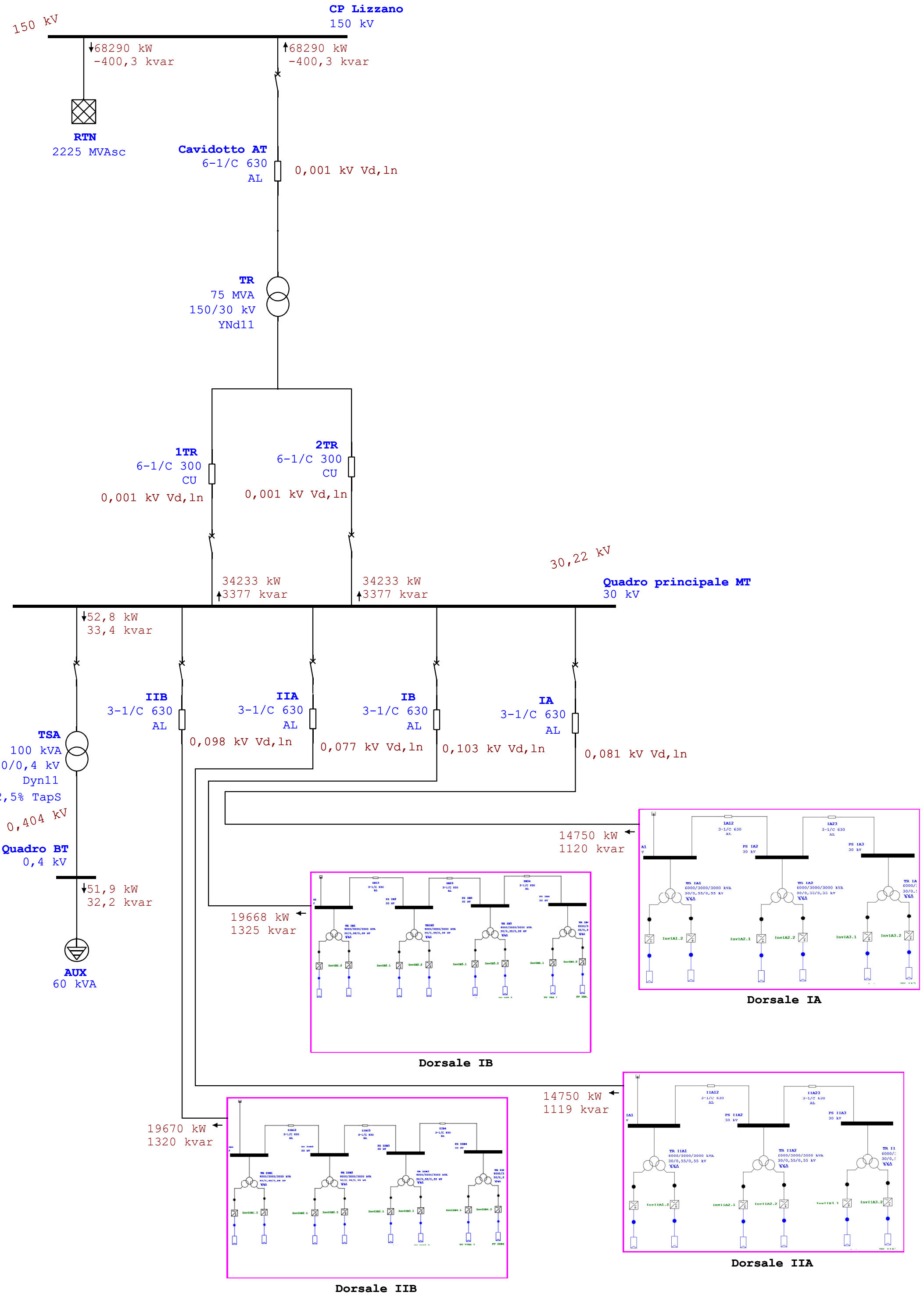


One-Line Diagram - SLD=>Dorsale IB (Load Flow Analysis)

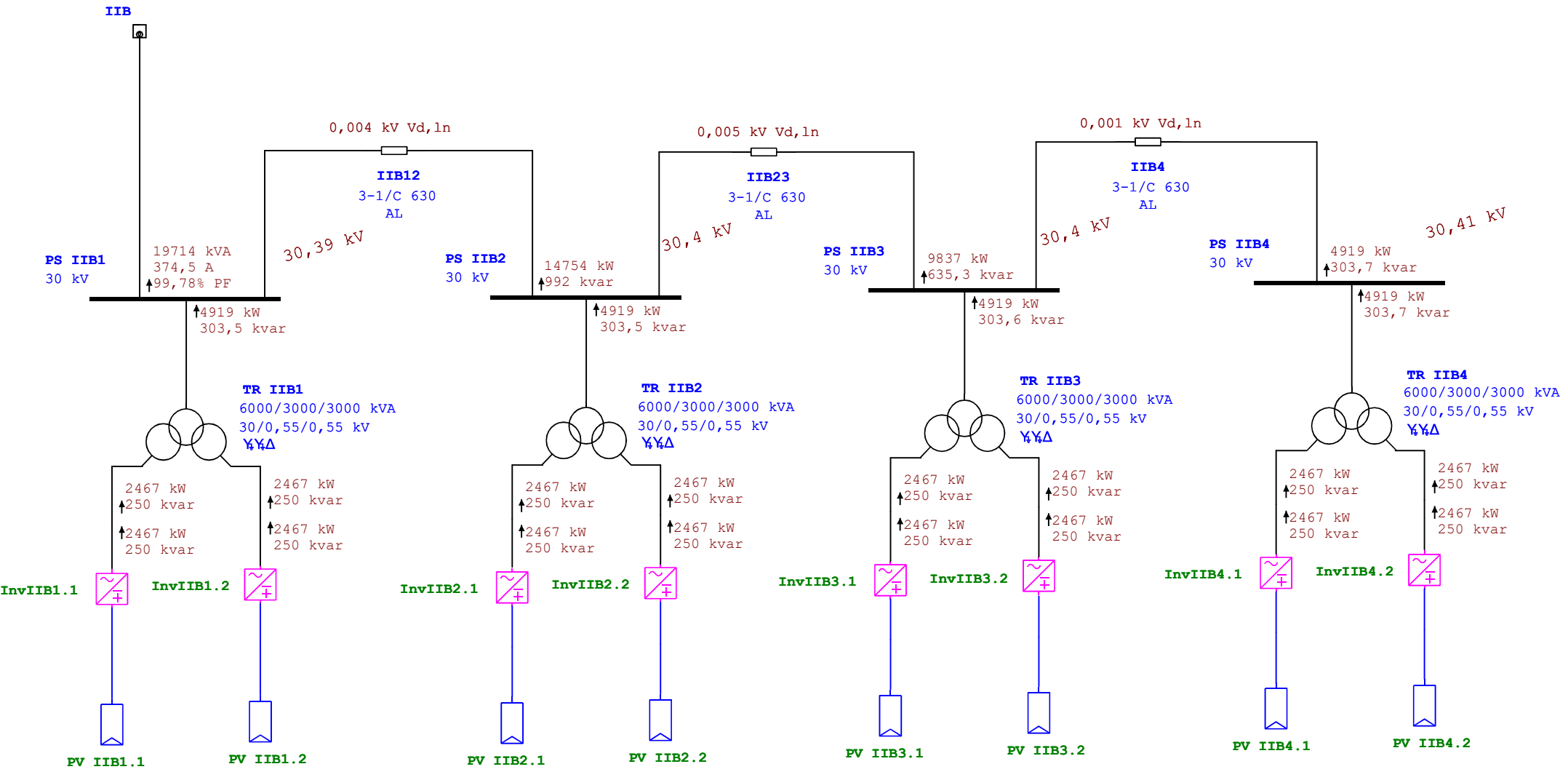


One-Line Diagram - SLD=>Dorsale IA (Load Flow Analysis)

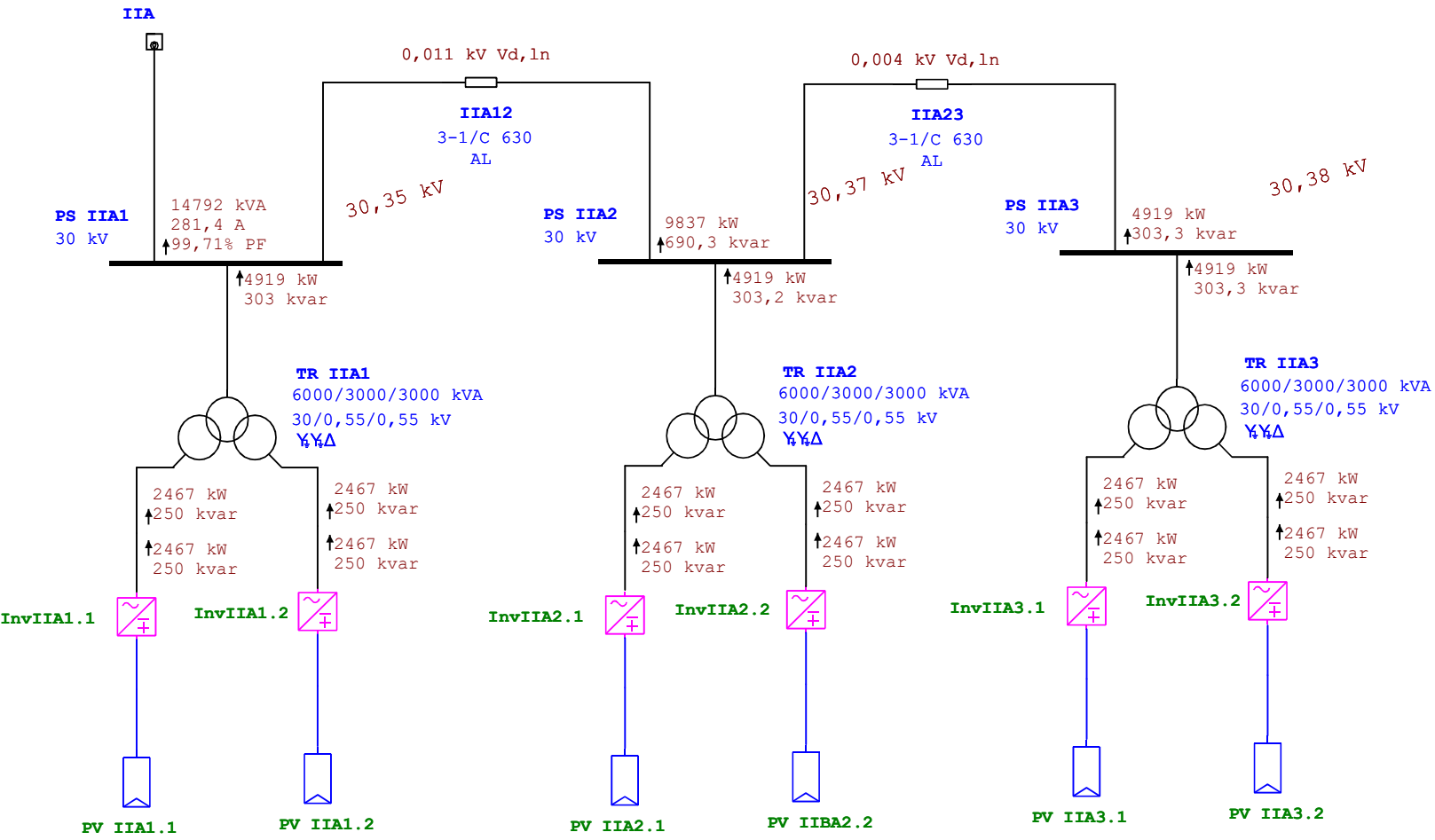



150 kV
CP Lizzano
150 kV
68290 kW
-400,3 kvar
68290 kW
-400,3 kvar
RTN
2225 MVAsc
Cavidotto AT
6-1/C 630
AL
0,001 kV Vd,ln
TR
75 MVA
150/30 kV
YNd11
1TR
6-1/C 300
CU
0,001 kV Vd,ln
2TR
6-1/C 300
CU
0,001 kV Vd,ln
30,22 kV
Quadro principale MT
30 kV
34233 kW
3377 kvar
34233 kW
3377 kvar
52,8 kW
33,4 kvar
IIB
3-1/C 630
AL
0,098 kV Vd,ln
IIA
3-1/C 630
AL
0,077 kV Vd,ln
IB
3-1/C 630
AL
0,103 kV Vd,ln
IA
3-1/C 630
AL
0,081 kV Vd,ln
TSA
100 kVA
30/0,4 kV
Dyn11
2,5% TapS
0,404 kV
Quadro BT
0,4 kV
51,9 kW
32,2 kvar
AUX
60 kVA
14750 kW
1120 kvar
19668 kW
1325 kvar
14750 kW
1119 kvar
19670 kW
1320 kvar
Dorsale IA
Dorsale IB
Dorsale IIA
Dorsale IIB

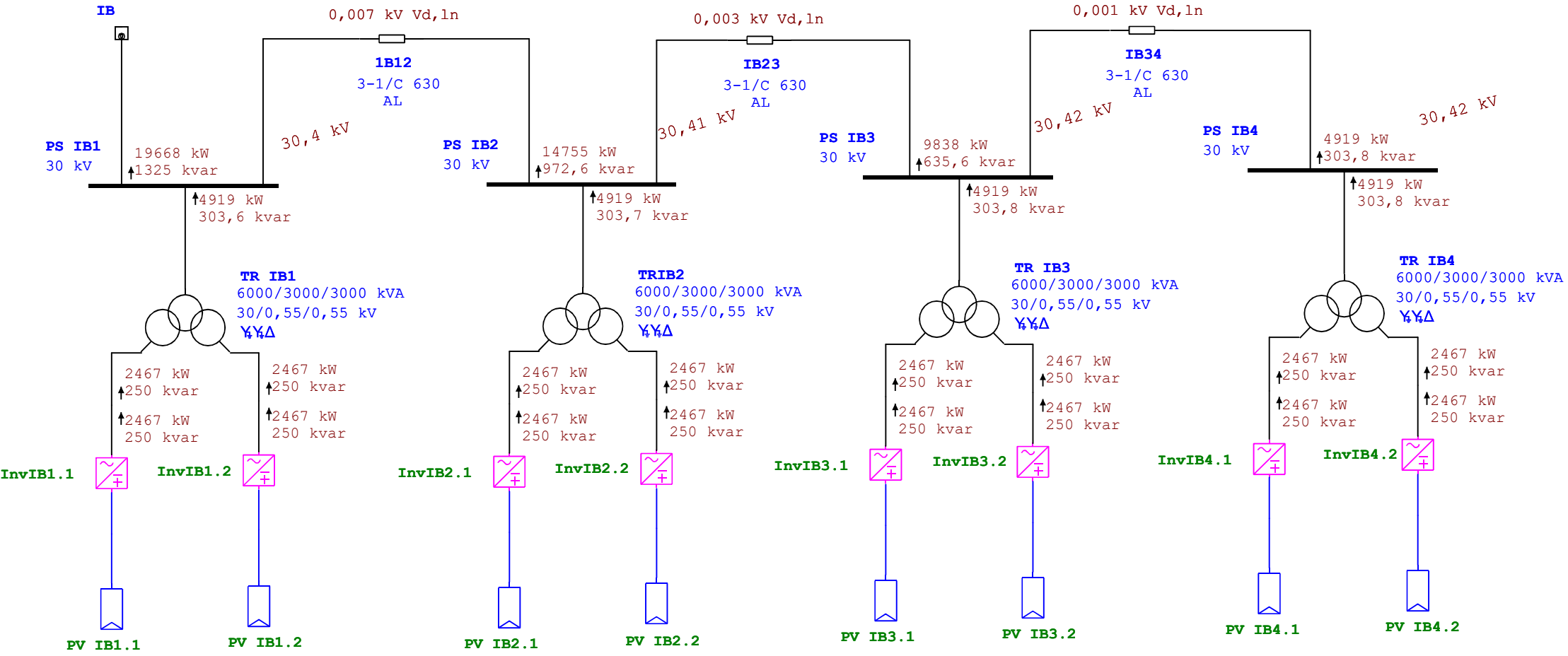
One-Line Diagram - SLD=>Dorsale IIB (Load Flow Analysis)



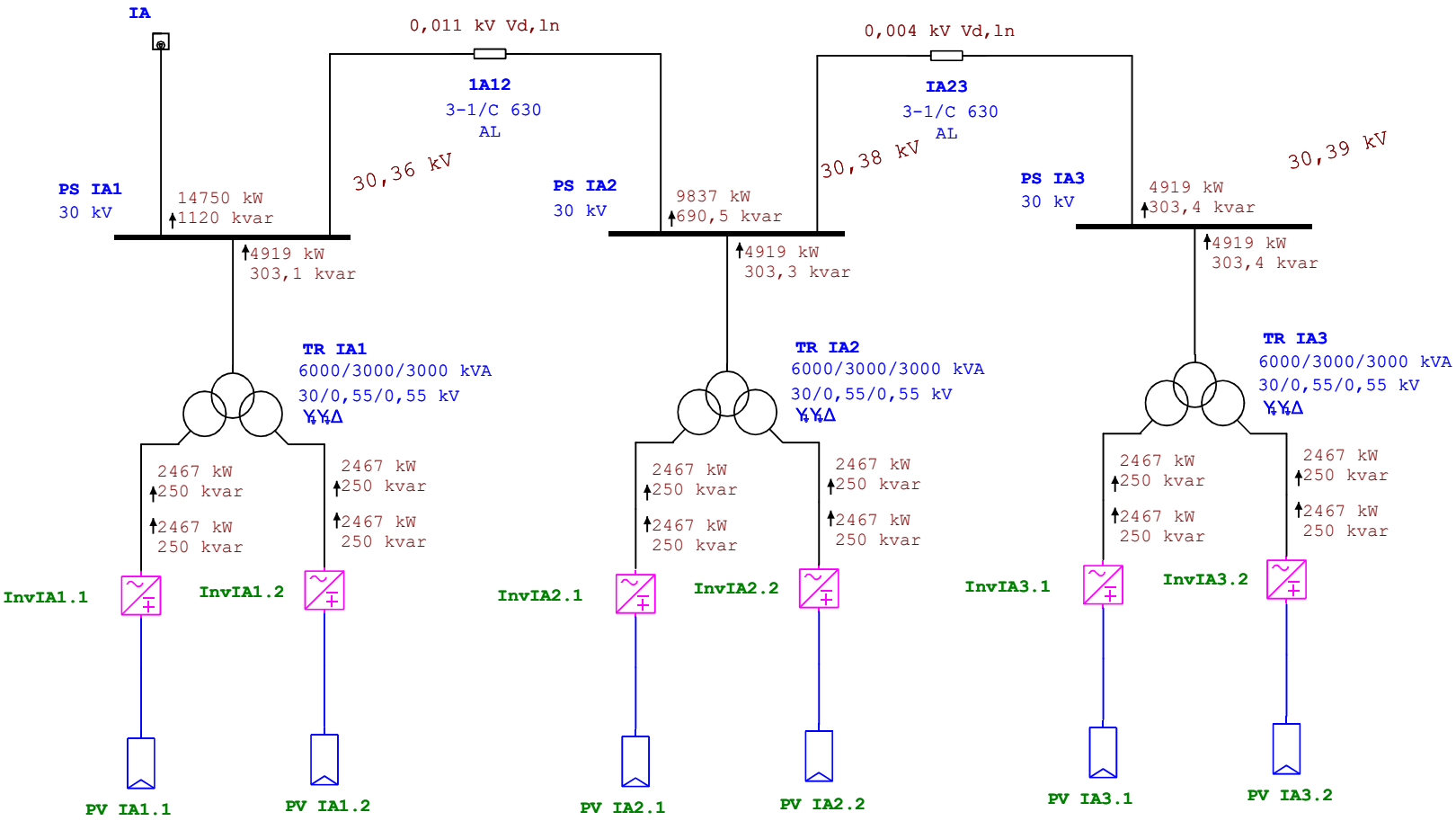
One-Line Diagram - SLD=>Dorsale IIA (Load Flow Analysis)



One-Line Diagram - SLD=>Dorsale IB (Load Flow Analysis)



One-Line Diagram - SLD=>Dorsale IA (Load Flow Analysis)



Electrical Transient Analyzer Program

Load Flow Analysis

Loading Category (1): Design

Generation Category (1): Design

Load Diversity Factor: None

	Swing	V-Control	Load	Total
Number of Buses:	1	0	46	47

	XFMR2	XFMR3	Reactor	Line/Cable	Impedance	Tie PD	Total
Number of Branches:	2	14	0	17	0	0	33

Method of Solution:	Adaptive Newton-Raphson Method
Maximum No. of Iteration:	99
Precision of Solution:	0.0001000
System Frequency:	50.00 Hz
Unit System:	Metric
Project Filename:	Calapricello_20201218
Output Filename:	C:\Users\Maurizio\Desktop\Modelli ETAP\Calapricello\Calapricello_rev001\Untitled.lfr

Adjustments

Tolerance	Apply Adjustments	Individual /Global	Percent
Transformer Impedance:	Yes	Individual	
Reactor Impedance:	Yes	Individual	
Overload Heater Resistance:	No		
Transmission Line Length:	No		
Cable Length:	No		

Temperature Correction	Apply Adjustments	Individual /Global	Degree C
Transmission Line Resistance:	Yes	Individual	
Cable Resistance:	Yes	Individual	

Bus Input Data

Bus			Initial Voltage		Load							
					Constant kVA		Constant Z		Constant I		Generic	
ID	kV	Sub-sys	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar
Bus2	0.550	1	100.0	0.0								
Bus3	0.550	1	100.0	0.0								
Bus4	0.550	1	100.0	0.0								
Bus5	0.550	1	100.0	0.0								
Bus6	0.550	1	100.0	0.0								
Bus7	0.550	1	100.0	0.0								
Bus8	0.550	1	100.0	0.0								
Bus9	0.550	1	100.0	0.0								
Bus13	0.550	1	100.0	0.0								
Bus14	0.550	1	100.0	0.0								
Bus15	0.550	1	100.0	0.0								
Bus16	0.550	1	100.0	0.0								
Bus17	0.550	1	100.0	0.0								
Bus18	0.550	1	100.0	0.0								
Bus19	0.550	1	100.0	0.0								
Bus20	0.550	1	100.0	0.0								
Bus21	0.550	1	100.0	0.0								
Bus22	0.550	1	100.0	0.0								
Bus23	0.550	1	100.0	0.0								
Bus24	0.550	1	100.0	0.0								
Bus27	0.550	1	100.0	0.0								
Bus28	0.550	1	100.0	0.0								
Bus35	0.550	1	100.0	0.0								
Bus36	0.550	1	100.0	0.0								
Bus37	0.550	1	100.0	0.0								
Bus38	0.550	1	100.0	0.0								
Bus39	0.550	1	100.0	0.0								
Bus40	0.550	1	100.0	0.0								
CP Lizzano	150.000	1	100.0	0.0								
PS IA1	30.000	1	100.0	0.0								
PS IA2	30.000	1	100.0	0.0								
PS IA3	30.000	1	100.0	0.0								
PS IB1	30.000	1	100.0	0.0								

Bus			Initial Voltage		Load							
					Constant kVA		Constant Z		Constant I		Generic	
ID	kV	Sub-sys	% Mag.	Ang.	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar
PS IB2	30.000	1	100.0	0.0								
PS IB3	30.000	1	100.0	0.0								
PS IB4	30.000	1	100.0	0.0								
PS IIA1	30.000	1	100.0	0.0								
PS IIA2	30.000	1	100.0	0.0								
PS IIA3	30.000	1	100.0	0.0								
PS IIB1	30.000	1	100.0	0.0								
PS IIB2	30.000	1	100.0	0.0								
PS IIB3	30.000	1	100.0	0.0								
PS IIB4	30.000	1	100.0	0.0								
Quadro BT	0.400	1	100.0	0.0	0.003	0.002	0.048	0.030				
Quadro principale MT	30.000	1	100.0	0.0								
Stallo AT	150.000	1	100.0	0.0								
TRsec	30.000	1	100.0	0.0								
Total Number of Buses: 47					0.003	0.002	0.048	0.030	0.000	0.000	0.000	0.000

Generation Bus				Voltage		Generation			Mvar Limits	
ID	kV	Type	Sub-sys	% Mag.	Angle	MW	Mvar	% PF	Max	Min
Bus2	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus3	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus4	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus5	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus6	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus7	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus8	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus9	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus13	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus14	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus15	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus16	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus17	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus18	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus19	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus20	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus21	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		

Generation Bus				Voltage		Generation			Mvar Limits	
ID	kV	Type	Sub-sys	% Mag.	Angle	MW	Mvar	% PF	Max	Min
Bus22	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus23	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus24	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus27	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus28	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus35	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus36	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus37	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus38	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus39	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
Bus40	0.550	Mvar/PF Control	1	100.0	0.0	2.467	0.250	99.5		
CP Lizzano	150.000	Swing	1	100.0	0.0					
						69.076	7.000			

Line/Cable Input Data

ohms or siemens/1000 m per Conductor (Cable) or per Phase (Line)

Line/Cable ID	Library	Size	Length Adj. (m)	% Tol.	#/Phase	T (°C)	R	X	Y
1A12	20NALN1	630	950.0	0.0	1	75	0.057171	0.089000	0.0001539
1B12	20NALN1	630	400.0	0.0	1	75	0.057171	0.089000	0.0001539
1TR	33NCUS1	300	25.0	0.0	2	75	0.076302	0.121000	
2TR	33NCUS1	300	25.0	0.0	2	75	0.076302	0.121000	
Cavidotto AT	20NALS1	630	90.0	0.0	2	75	0.057171	0.089000	0.0001539
IA	20NALN1	630	4400.0	0.0	1	75	0.057171	0.089000	0.0001539
IA23	20NALN1	630	600.0	0.0	1	75	0.057171	0.089000	0.0001539
IB	20NALN1	630	4300.0	0.0	1	75	0.057171	0.089000	0.0001539
IB23	20NALN1	630	250.0	0.0	1	75	0.057171	0.089000	0.0001539
IB34	20NALN1	630	200.0	0.0	1	75	0.057171	0.089000	0.0001539
IIA	20NALN1	630	4200.0	0.0	1	75	0.057171	0.089000	0.0001539
IIA12	20NALN1	630	950.0	0.0	1	75	0.057171	0.089000	0.0001539
IIA23	20NALN1	630	600.0	0.0	1	75	0.057171	0.089000	0.0001539
IIB	20NALN1	630	4100.0	0.0	1	75	0.057171	0.089000	0.0001539
IIB4	20NALN1	630	200.0	0.0	1	75	0.057171	0.089000	0.0001539
IIB12	20NALN1	630	200.0	0.0	1	75	0.057171	0.089000	0.0001539
IIB23	20NALN1	630	400.0	0.0	1	75	0.057171	0.089000	0.0001539

Line / Cable resistances are listed at the specified temperatures.

2-Winding Transformer Input Data

Transformer		Rating					Z Variation			% Tap Setting		Adjusted	Phase Shift	
ID	Phase	MVA	Prim. kV	Sec. kV	% Z1	X1/R1	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
TR	3-Phase	75.000	150.000	30.000	12.50	45.00	0	0	0	0	0	12.5000	YNd	0.000
TSA	3-Phase	0.100	30.000	0.400	4.00	1.50	0	0	0	0	2.500	4.0000	Dyn	0.000

3-Winding Transformer Input Data

Transformer	Rating			Tap	Impedance				Z Variation		Phase Shift	
ID	Winding	MVA	kV	%	% Z1	X1/R1	MVAb	% Tol.	+ 5%	- 5%	Type	Angle
TR IA1	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IA2	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IA3	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IB1	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IB3	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IB4	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIA1	Primary:	6.000	30.000	0	Zps = 8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst = 4.00	13.00	6.000	0			Std Pos. Seq.	0.000

3-Winding Transformer Input Data

Transformer		Rating		Tap	Impedance				Z Variation		Phase Shift	
ID	Winding	MVA	kV	%	% Z1		X1/R1	MVAb	% Tol.	+ 5%	- 5%	Type	Angle
TR IIA2	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIA3	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIB1	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIB2	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIB3	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TR IIB4	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
TRIB2	Primary:	6.000	30.000	0	Zps =	8.00	13.00	6.000	0	0	0		
	Secondary:	3.000	0.550	0	Zpt =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000
	Tertiary:	3.000	0.550	0	Zst =	4.00	13.00	6.000	0			Std Pos. Seq.	0.000

Branch Connections

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVA Base			
ID	Type	From Bus	To Bus	R	X	Z	Y
TR	2W XFMR	Stallo AT	TRsec	0.37	16.66	16.67	
TSA	2W XFMR	Quadro principale MT	Quadro BT	2274.27	3411.41	4100.00	
TR IA1	3W Xfmr	PS IA1	Bus27				
	3W Xfmr	PS IA1	Bus28	5.11	66.47	66.67	
	3W Xfmr	Bus27	Bus28	5.11	66.47	66.67	
TR IA2	3W Xfmr	PS IA2	Bus21				
	3W Xfmr	PS IA2	Bus22	5.11	66.47	66.67	
	3W Xfmr	Bus21	Bus22	5.11	66.47	66.67	
TR IA3	3W Xfmr	PS IA3	Bus23				
	3W Xfmr	PS IA3	Bus24	5.11	66.47	66.67	
	3W Xfmr	Bus23	Bus24	5.11	66.47	66.67	
TR IB1	3W Xfmr	PS IB1	Bus19				
	3W Xfmr	PS IB1	Bus20	5.11	66.47	66.67	
	3W Xfmr	Bus19	Bus20	5.11	66.47	66.67	
TR IB3	3W Xfmr	PS IB3	Bus15				
	3W Xfmr	PS IB3	Bus16	5.11	66.47	66.67	
	3W Xfmr	Bus15	Bus16	5.11	66.47	66.67	
TR IB4	3W Xfmr	PS IB4	Bus17				
	3W Xfmr	PS IB4	Bus18	5.11	66.47	66.67	
	3W Xfmr	Bus17	Bus18	5.11	66.47	66.67	
TR IIA1	3W Xfmr	PS IIA1	Bus39				
	3W Xfmr	PS IIA1	Bus40	5.11	66.47	66.67	
	3W Xfmr	Bus39	Bus40	5.11	66.47	66.67	
TR IIA2	3W Xfmr	PS IIA2	Bus35				
	3W Xfmr	PS IIA2	Bus36	5.11	66.47	66.67	
	3W Xfmr	Bus35	Bus36	5.11	66.47	66.67	
TR IIA3	3W Xfmr	PS IIA3	Bus37				
	3W Xfmr	PS IIA3	Bus38	5.11	66.47	66.67	
	3W Xfmr	Bus37	Bus38	5.11	66.47	66.67	
TR IIB1	3W Xfmr	PS IIB1	Bus2				
	3W Xfmr	PS IIB1	Bus3	5.11	66.47	66.67	
	3W Xfmr	Bus2	Bus3	5.11	66.47	66.67	
TR IIB2	3W Xfmr	PS IIB2	Bus4				
	3W Xfmr	PS IIB2	Bus5	5.11	66.47	66.67	
	3W Xfmr	Bus4	Bus5	5.11	66.47	66.67	
TR IIB3	3W Xfmr	PS IIB3	Bus6				

CKT/Branch		Connected Bus ID		% Impedance, Pos. Seq., 100 MVA Base			
ID	Type	From Bus	To Bus	R	X	Z	Y
	3W Xfmr	PS IIB3	Bus7	5.11	66.47	66.67	
	3W Xfmr	Bus6	Bus7	5.11	66.47	66.67	
TR IIB4	3W Xfmr	PS IIB4	Bus8				
	3W Xfmr	PS IIB4	Bus9	5.11	66.47	66.67	
	3W Xfmr	Bus8	Bus9	5.11	66.47	66.67	
TRIB2	3W Xfmr	PS IB2	Bus13				
	3W Xfmr	PS IB2	Bus14	5.11	66.47	66.67	
	3W Xfmr	Bus13	Bus14	5.11	66.47	66.67	
1A12	Cable	PS IA2	PS IA1	0.60	0.94	1.12	0.1315845
1B12	Cable	PS IB2	PS IB1	0.25	0.40	0.47	0.0554040
1TR	Cable	TRsec	Quadro principale MT	0.01	0.02	0.02	
2TR	Cable	TRsec	Quadro principale MT	0.01	0.02	0.02	
Cavidotto AT	Cable	CP Lizzano	Stallo AT	0.00	0.00	0.00	0.6232949
IA	Cable	Quadro principale MT	PS IA1	2.80	4.35	5.17	0.6094440
IA23	Cable	PS IA3	PS IA2	0.38	0.59	0.71	0.0831060
IB	Cable	Quadro principale MT	PS IB1	2.73	4.25	5.05	0.5955930
IB23	Cable	PS IB3	PS IB2	0.16	0.25	0.29	0.0346275
IB34	Cable	PS IB4	PS IB3	0.13	0.20	0.24	0.0277020
IIA	Cable	Quadro principale MT	PS IIA1	2.67	4.15	4.94	0.5817420
IIA12	Cable	PS IIA2	PS IIA1	0.60	0.94	1.12	0.1315845
IIA23	Cable	PS IIA3	PS IIA2	0.38	0.59	0.71	0.0831060
IIB	Cable	Quadro principale MT	PS IIB1	2.60	4.05	4.82	0.5678910
IIB4	Cable	PS IIB4	PS IIB3	0.13	0.20	0.24	0.0277020
IIB12	Cable	PS IIB2	PS IIB1	0.13	0.20	0.24	0.0277020
IIB23	Cable	PS IIB3	PS IIB2	0.25	0.40	0.47	0.0554040

LOAD FLOW REPORT

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
Bus2	0.550	102.072	9.6	2.467	0.250	0	0	Bus3 & PS IIB1	2.467	0.250	2550.1	99.5	
Bus3	0.550	101.798	8.7	2.467	0.250	0	0	PS IIB1 & Bus2	2.467	0.250	2557.0	99.5	
Bus4	0.550	102.092	9.6	2.467	0.250	0	0	Bus5 & PS IIB2	2.467	0.250	2549.6	99.5	
Bus5	0.550	101.819	8.7	2.467	0.250	0	0	PS IIB2 & Bus4	2.467	0.250	2556.5	99.5	
Bus6	0.550	102.119	9.7	2.467	0.250	0	0	Bus7 & PS IIB3	2.467	0.250	2548.9	99.5	
Bus7	0.550	101.846	8.8	2.467	0.250	0	0	PS IIB3 & Bus6	2.467	0.250	2555.8	99.5	
Bus8	0.550	102.126	9.7	2.467	0.250	0	0	Bus9 & PS IIB4	2.467	0.250	2548.8	99.5	
Bus9	0.550	101.852	8.8	2.467	0.250	0	0	PS IIB4 & Bus8	2.467	0.250	2555.6	99.5	
Bus13	0.550	102.141	9.7	2.467	0.250	0	0	Bus14 & PS IB2	2.467	0.250	2548.4	99.5	
Bus14	0.550	101.867	8.8	2.467	0.250	0	0	PS IB2 & Bus13	2.467	0.250	2555.2	99.5	
Bus15	0.550	102.158	9.7	2.467	0.250	0	0	Bus16 & PS IB3	2.467	0.250	2548.0	99.5	
Bus16	0.550	101.884	8.8	2.467	0.250	0	0	PS IB3 & Bus15	2.467	0.250	2554.8	99.5	
Bus17	0.550	102.164	9.7	2.467	0.250	0	0	Bus18 & PS IB4	2.467	0.250	2547.8	99.5	
Bus18	0.550	101.891	8.8	2.467	0.250	0	0	PS IB4 & Bus17	2.467	0.250	2554.6	99.5	
Bus19	0.550	102.100	9.6	2.467	0.250	0	0	Bus20 & PS IB1	2.467	0.250	2549.4	99.5	
Bus20	0.550	101.826	8.7	2.467	0.250	0	0	PS IB1 & Bus19	2.467	0.250	2556.3	99.5	
Bus21	0.550	102.038	9.6	2.467	0.250	0	0	Bus22 & PS IA2	2.467	0.250	2551.0	99.5	
Bus22	0.550	101.764	8.7	2.467	0.250	0	0	PS IA2 & Bus21	2.467	0.250	2557.8	99.5	

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
Bus23	0.550	102.058	9.6	2.467	0.250	0	0	Bus24	2.467	0.250	2550.5	99.5	
								& PS IA3					
Bus24	0.550	101.784	8.7	2.467	0.250	0	0	PS IA3	2.467	0.250	2557.3	99.5	
								& Bus23					
Bus27	0.550	101.972	9.5	2.467	0.250	0	0	Bus28	2.467	0.250	2552.6	99.5	
								& PS IA1					
Bus28	0.550	101.698	8.6	2.467	0.250	0	0	PS IA1	2.467	0.250	2559.5	99.5	
								& Bus27					
Bus35	0.550	102.016	9.6	2.467	0.250	0	0	Bus36	2.467	0.250	2551.5	99.5	
								& PS IIA2					
Bus36	0.550	101.742	8.7	2.467	0.250	0	0	PS IIA2	2.467	0.250	2558.4	99.5	
								& Bus35					
Bus37	0.550	102.036	9.6	2.467	0.250	0	0	Bus38	2.467	0.250	2551.0	99.5	
								& PS IIA3					
Bus38	0.550	101.763	8.7	2.467	0.250	0	0	PS IIA3	2.467	0.250	2557.9	99.5	
								& Bus37					
Bus39	0.550	101.951	9.5	2.467	0.250	0	0	Bus40	2.467	0.250	2553.1	99.5	
								& PS IIA1					
Bus40	0.550	101.677	8.6	2.467	0.250	0	0	PS IIA1	2.467	0.250	2560.0	99.5	
								& Bus39					
* CP Lizzano	150.000	100.000	0.0	-68.290	0.400	0	0	Stallo AT	-68.290	0.400	262.9	100.0	
PS IA1	30.000	101.200	6.8	0	0	0	0	PS IA2	-9.831	-0.816	187.6	99.7	
								Quadro principale MT	14.750	1.120	281.3	99.7	
								Bus27	-4.919	-0.303	93.7	99.8	
								& Bus28					
PS IA2	30.000	101.265	6.9	0	0	0	0	PS IA1	9.837	0.691	187.4	99.8	
								PS IA3	-4.918	-0.387	93.8	99.7	
								Bus21	-4.919	-0.303	93.7	99.8	
								& Bus22					
PS IA3	30.000	101.286	6.9	0	0	0	0	PS IA2	4.919	0.303	93.6	99.8	
								Bus23	-4.919	-0.303	93.6	99.8	
								& Bus24					
PS IB1	30.000	101.328	6.9	0	0	0	0	PS IB2	-14.750	-1.021	280.8	99.8	
								Quadro principale MT	19.668	1.325	374.4	99.8	
								Bus19	-4.919	-0.304	93.6	99.8	
								& Bus20					
PS IB2	30.000	101.369	7.0	0	0	0	0	PS IB1	14.755	0.973	280.7	99.8	
								PS IB3	-9.836	-0.669	187.2	99.8	
								Bus13	-4.919	-0.304	93.6	99.8	

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
								& Bus14					
PS IB3	30.000	101.386	7.0	0	0	0	0	PS IB2	9.838	0.636	187.1	99.8	
								PS IB4	-4.919	-0.332	93.6	99.8	
								Bus15	-4.919	-0.304	93.5	99.8	
								& Bus16					
PS IB4	30.000	101.393	7.0	0	0	0	0	PS IB3	4.919	0.304	93.5	99.8	
								Bus17	-4.919	-0.304	93.5	99.8	
								& Bus18					
PS IIA1	30.000	101.178	6.8	0	0	0	0	Quadro principale MT	14.750	1.119	281.4	99.7	
								PS IIA2	-9.831	-0.816	187.6	99.7	
								Bus39	-4.919	-0.303	93.7	99.8	
								& Bus40					
PS IIA2	30.000	101.244	6.9	0	0	0	0	PS IIA1	9.837	0.690	187.4	99.8	
								PS IIA3	-4.918	-0.387	93.8	99.7	
								Bus35	-4.919	-0.303	93.7	99.8	
								& Bus36					
PS IIA3	30.000	101.264	6.9	0	0	0	0	PS IIA2	4.919	0.303	93.7	99.8	
								Bus37	-4.919	-0.303	93.7	99.8	
								& Bus38					
PS IIB1	30.000	101.300	6.9	0	0	0	0	Quadro principale MT	19.670	1.320	374.5	99.8	
								PS IIB2	-14.751	-1.016	280.9	99.8	
								Bus2	-4.919	-0.303	93.6	99.8	
								& Bus3					
PS IIB2	30.000	101.321	6.9	0	0	0	0	PS IIB1	14.754	0.992	280.9	99.8	
								PS IIB3	-9.835	-0.688	187.3	99.8	
								Bus4	-4.919	-0.304	93.6	99.8	
								& Bus5					
PS IIB3	30.000	101.348	7.0	0	0	0	0	PS IIB4	-4.919	-0.332	93.6	99.8	
								PS IIB2	9.837	0.635	187.2	99.8	
								Bus6	-4.919	-0.304	93.6	99.8	
								& Bus7					
PS IIB4	30.000	101.355	7.0	0	0	0	0	PS IIB3	4.919	0.304	93.6	99.8	
								Bus8	-4.919	-0.304	93.6	99.8	
								& Bus9					
Quadro BT	0.400	100.933	5.9	0	0	0.052	0.032	Quadro principale MT	-0.052	-0.032	87.3	85.0	2.500
Quadro principale MT	30.000	100.733	6.5	0	0	0	0	TRsec	34.233	3.377	657.2	99.5	
								TRsec	34.233	3.377	657.2	99.5	
								PS IA1	-14.690	-1.648	282.4	99.4	
								PS IB1	-19.565	-1.771	375.3	99.6	

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
								PS IIA1	-14.693	-1.623	282.4	99.4	
								PS IIB1	-19.571	-1.745	375.4	99.6	
								Quadro BT	0.053	0.033	1.2	84.5	
Stallo AT	150.000	100.001	0.0	0	0	0	0	CP Lizzano	68.291	-1.023	262.9	-100.0	
								TRsec	-68.291	1.023	262.9	-100.0	
TRsec	30.000	100.728	6.5	0	0	0	0	Quadro principale MT	-34.232	-3.375	657.2	99.5	
								Quadro principale MT	-34.232	-3.375	657.2	99.5	
								Stallo AT	68.464	6.750	1314.4	99.5	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

\# Indicates a bus with a load mismatch of more than 0.1 MVA

Bus Loading Summary Report

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic					Percent
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar	MVA	% PF	Amp	Loading
Bus2	0.550										2.480	99.5	2550.1	
Bus3	0.550										2.480	99.5	2557.0	
Bus4	0.550										2.480	99.5	2549.6	
Bus5	0.550										2.480	99.5	2556.5	
Bus6	0.550										2.480	99.5	2548.9	
Bus7	0.550										2.480	99.5	2555.8	
Bus8	0.550										2.480	99.5	2548.8	
Bus9	0.550										2.480	99.5	2555.6	
Bus13	0.550										2.480	99.5	2548.4	
Bus14	0.550										2.480	99.5	2555.2	
Bus15	0.550										2.480	99.5	2548.0	
Bus16	0.550										2.480	99.5	2554.8	
Bus17	0.550										2.480	99.5	2547.8	
Bus18	0.550										2.480	99.5	2554.6	
Bus19	0.550										2.480	99.5	2549.4	
Bus20	0.550										2.480	99.5	2556.3	
Bus21	0.550										2.480	99.5	2551.0	
Bus22	0.550										2.480	99.5	2557.8	
Bus23	0.550										2.480	99.5	2550.5	
Bus24	0.550										2.480	99.5	2557.3	
Bus27	0.550										2.480	99.5	2552.6	
Bus28	0.550										2.480	99.5	2559.5	
Bus35	0.550										2.480	99.5	2551.5	
Bus36	0.550										2.480	99.5	2558.4	
Bus37	0.550										2.480	99.5	2551.0	
Bus38	0.550										2.480	99.5	2557.9	
Bus39	0.550										2.480	99.5	2553.1	
Bus40	0.550										2.480	99.5	2560.0	
CP Lizzano	150.000										68.292	100.0	262.9	
PS IA1	30.000										14.792	99.7	281.3	
PS IA2	30.000										9.861	99.8	187.4	
PS IA3	30.000										4.928	99.8	93.6	
PS IB1	30.000										19.713	99.8	374.4	
PS IB2	30.000										14.787	99.8	280.7	
PS IB3	30.000										9.858	99.8	187.1	
PS IB4	30.000										4.928	99.8	93.5	
PS IIA1	30.000										14.792	99.7	281.4	
PS IIA2	30.000										9.861	99.8	187.4	
PS IIA3	30.000										4.928	99.8	93.7	

Bus			Directly Connected Load								Total Bus Load			
			Constant kVA		Constant Z		Constant I		Generic					Percent
ID	kV	Rated Amp	MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar	MVA	% PF	Amp	Loading
PS IIB1	30.000										19.714	99.8	374.5	
PS IIB2	30.000										14.787	99.8	280.9	
PS IIB3	30.000										9.858	99.8	187.2	
PS IIB4	30.000										4.928	99.8	93.6	
Quadro BT	0.400		0.003	0.002	0.049	0.030					0.061	85.0	87.3	
Quadro principale MT	30.000										68.854	99.5	1315.5	
Stallo AT	150.000										68.299	100.0	262.9	
TRsec	30.000										68.796	99.5	1314.4	

* Indicates operating load of a bus exceeds the bus critical limit (100.0% of the Continuous Ampere rating).
# Indicates operating load of a bus exceeds the bus marginal limit (95.0% of the Continuous Ampere rating).

Branch Loading Summary Report

CKT / Branch		Cable & Reactor			Transformer				
						Loading (input)		Loading (output)	
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	MVA	%	MVA	%
1A12	Cable	442.00	187.60	42.44					
1B12	Cable	442.00	280.80	63.53					
1TR	Cable	932.28	657.20	70.49					
2TR	Cable	932.28	657.20	70.49					
Cavidotto AT	Cable	552.00	262.88	47.62					
IA	Cable	442.00	282.41	63.89					
IA23	Cable	442.00	93.75	21.21					
IB	Cable	442.00	375.31	84.91					
IB23	Cable	442.00	187.17	42.35					
IB34	Cable	442.00	93.58	21.17					
IIA	Cable	442.00	282.41	63.89					
IIA12	Cable	442.00	187.64	42.45					
IIA23	Cable	442.00	93.77	21.22					
IIB	Cable	442.00	375.39	84.93					
IIB4	Cable	442.00	93.61	21.18					
IIB12	Cable	442.00	280.91	63.55					
IIB23	Cable	442.00	187.27	42.37					
TR	Transformer				75.000	68.796	91.7	68.299	91.1
TSA	Transformer				0.100	0.062	62.5	0.061	61.1
TR IA1	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IA2	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IA3	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IB1	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IB3	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		

CKT / Branch		Cable & Reactor			Transformer				
						Loading (input)		Loading (output)	
ID	Type	Ampacity (Amp)	Loading Amp	%	Capability (MVA)	MVA	%	MVA	%
TR IB3	3W XFMR t				3.000	2.480	82.7		
TR IB4	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIA1	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIA2	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIA3	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIB1	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIB2	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIB3	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TR IIB4	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		
TRIB2	3W XFMR p				6.000	4.928	82.1		
	3W XFMR s				3.000	2.480	82.7		
	3W XFMR t				3.000	2.480	82.7		

* Indicates a branch with operating load exceeding the branch capability.

Branch Losses Summary Report

Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
Cavidotto AT	-68.290	0.400	68.291	-1.023	0.5	-622.5	100.0	100.0	0.00
1A12	-9.831	-0.816	9.837	0.691	5.7	-125.9	101.2	101.3	0.07
IA	14.750	1.120	-14.690	-1.648	59.9	-528.0	101.2	100.7	0.47
IA23	-4.918	-0.387	4.919	0.303	0.9	-83.8	101.3	101.3	0.02
1B12	-14.750	-1.021	14.755	0.973	5.4	-48.5	101.3	101.4	0.04
IB	19.668	1.325	-19.565	-1.771	103.6	-446.6	101.3	100.7	0.60
IB23	-9.836	-0.669	9.838	0.636	1.5	-33.3	101.4	101.4	0.02
IB34	-4.919	-0.332	4.919	0.304	0.3	-28.0	101.4	101.4	0.01
IIA	14.750	1.119	-14.693	-1.623	57.2	-503.8	101.2	100.7	0.45
IIA12	-9.831	-0.816	9.837	0.690	5.7	-125.9	101.2	101.2	0.07
IIA23	-4.918	-0.387	4.919	0.303	0.9	-83.8	101.2	101.3	0.02
IIB	19.670	1.320	-19.571	-1.745	98.9	-425.6	101.3	100.7	0.57
IIB12	-14.751	-1.016	14.754	0.992	2.7	-24.2	101.3	101.3	0.02
IIB23	-9.835	-0.688	9.837	0.635	2.4	-53.1	101.3	101.3	0.03
IIB4	-4.919	-0.332	4.919	0.304	0.3	-28.0	101.3	101.4	0.01
TSA	-0.052	-0.032	0.053	0.033	0.9	1.3	100.9	100.7	0.20
1TR	34.233	3.377	-34.232	-3.375	1.2	2.0	100.7	100.7	0.00
2TR	34.233	3.377	-34.232	-3.375	1.2	2.0	100.7	100.7	0.00
TR	-68.291	1.023	68.464	6.750	172.7	7772.4	100.0	100.7	0.73
TR IA1	-4.919	-0.303	2.467	0.250	15.1	196.9	101.2	102.0	0.77
TR IA1	0.000	0.000	2.467	0.250			101.2	101.7	0.50
TR IA2	-4.919	-0.303	2.467	0.250	15.1	196.7	101.3	102.0	0.77
TR IA2	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IA3	-4.919	-0.303	2.467	0.250	15.1	196.6	101.3	102.1	0.77
TR IA3	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IB1	-4.919	-0.304	2.467	0.250	15.1	196.4	101.3	102.1	0.77
TR IB1	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IB3	-4.919	-0.304	2.467	0.250	15.1	196.2	101.4	102.2	0.77
TR IB3	0.000	0.000	2.467	0.250			101.4	101.9	0.50
TR IB4	-4.919	-0.304	2.467	0.250	15.1	196.2	101.4	102.2	0.77
TR IB4	0.000	0.000	2.467	0.250			101.4	101.9	0.50
TR IIA1	-4.919	-0.303	2.467	0.250	15.2	197.0	101.2	102.0	0.77
TR IIA1	0.000	0.000	2.467	0.250			101.2	101.7	0.50
TR IIA2	-4.919	-0.303	2.467	0.250	15.1	196.8	101.2	102.0	0.77

Branch ID	From-To Bus Flow		To-From Bus Flow		Losses		% Bus Voltage		Vd % Drop in Vmag
	MW	Mvar	MW	Mvar	kW	kvar	From	To	
TR IIA2	0.000	0.000	2.467	0.250			101.2	101.7	0.50
TR IIA3	-4.919	-0.303	2.467	0.250	15.1	196.7	101.3	102.0	0.77
TR IIA3	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IIB1	-4.919	-0.303	2.467	0.250	15.1	196.6	101.3	102.1	0.77
TR IIB1	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IIB2	-4.919	-0.304	2.467	0.250	15.1	196.5	101.3	102.1	0.77
TR IIB2	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IIB3	-4.919	-0.304	2.467	0.250	15.1	196.4	101.3	102.1	0.77
TR IIB3	0.000	0.000	2.467	0.250			101.3	101.8	0.50
TR IIB4	-4.919	-0.304	2.467	0.250	15.1	196.3	101.4	102.1	0.77
TR IIB4	0.000	0.000	2.467	0.250			101.4	101.9	0.50
TRIB2	-4.919	-0.304	2.467	0.250	15.1	196.3	101.4	102.1	0.77
TRIB2	0.000	0.000	2.467	0.250			101.4	101.9	0.50
					733.8	7368.2			

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

	MW	Mvar	MVA	% PF
Source (Swing Buses):	-68.290	0.400	68.292	100.00 Leading
Source (Non-Swing Buses):	69.076	7.000	69.430	99.49 Lagging
Total Demand:	0.786	7.400	7.442	10.56 Lagging
Total Motor Load:	0.003	0.002	0.004	85.00 Lagging
Total Static Load:	0.049	0.030	0.057	85.00 Lagging
Total Constant I Load:	0.000	0.000	0.000	
Total Generic Load:	0.000	0.000	0.000	
Apparent Losses:	0.734	7.368		
System Mismatch:	0.000	0.000		

Number of Iterations: 4