

ELECTRICAL CALCULATION SHEET

Doc. No: 240-0214-EMEL-CS00-0008

Job No. : 240

Client : BANGLADESH PETROLEUM EXPLORATION & PRODUCTION CO. LTD.

Location : SRIKAIL GAS FIELD, BANGLADESH

Item No. : -

Description : FAULT LEVEL CALCULATION

Project Title. : 60 MMSCFD GLYCOL DEHYDRATION TYPE GAS PROCESS PLANT

Year Built : 2015

Α	28/10/2015	4	ISSUED FOR APPROVAL	AS	MH	VG
Rev.	Date	Page	Description of Revision	Prepared	Checked	Approved



Electrical Calculation



CONSORTIUM OF ZICOM EQUIPMENT PTE LTD.



BANGLADESH PETROLEUM EXPLORATION & PRODUCTION CO. LTD.	Sheet		ZICOM	SINOPEC PETR	ORATION			
USER	BANGLADESH PETRO	EUM EXPLORATION & PRODUCTION CO. LTD.			DOC NO	240-0214-E	MEL-CS00-0008	
LOCATION	SRIKAIL GAS FIELD, B	ANGLADES	Н			SERVICE	FAULT LEVEL	CALCULATION
PROJECT			L DEHYDRATION TYPE NATURAL GAS PLANT					
JOB NO	240					TAG NO QUANTITY		
						Q0/111111		
Generator KVA Rating	345	kVA						
Line to Line Voltage								
Line to Neutral Voltage								
Full Load Ampere								
Genset Alternator Percentage		/ \						
Impedance	12.5	%						
impedance								
Fault at zero distance/terminal				Fault at zero d	listance/terminal			
		l	†		*		<u> </u>	1
Full Load Ampreres	498	Δ			Full Load Ampreres	498	Δ	
Multiplier,M1		А			Multiplier,M1	8		
Fault at Generator terminal	3984	۸			Fault at Generator terminal	5976		
L-L Fault	3.98		1	L-N Fault	Tault at Generator terminal	5.98		
L-L-L Fault(AFC)	4.58			L-IN I auit		5.96	KA	
For BUSBAR GROUP B						T		
Fault at some distance from terminal				Fault at some	distance from terminal			
51					51		_	
Distance from terminal, L	10	ft			Distance from terminal, L	10	ft	
No. of Conductor,N					No. of Conductor,N	1		
Conductor factor,C					Conductor factor,C	129900		
Factor,f	0.0013				Factor,f	0.004		
Multiplier,M2					Multiplier,M2	0.996		
Fault after 1st distance	3979				Fault after 1st distance	5952.1		
L-L Fault	3.98	kA		L-N Fault		5.95	kA	
L-L-L Fault(AFC)	4.57	kA						
Note		Formula						
Reff. Drawing: 240-0214-EMEL-DW00-00 DISTRIBUTION SYSTEM	For L-L Fault For L-N Fault							
For conductor factor, C reff. document is	$FLA_{L-L} = \frac{\mathit{KVARating} * 1000}{\mathit{L} - \mathit{LVoltags}} \qquad \qquad FLA_{L-N} = \frac{\mathit{KVARating} * 1000}{\mathit{L} - \mathit{NVoltags}}$							
FLA=Full Load Ampere AFC=Available Fault Current								
L-L Fault=Approx. 87% L-L-L Fault		Iultiplier, M1 = $\frac{100}{\% Percent Impedence}$ Multiplier, M2 = $\frac{1}{1+f}$						
L L I duit-Approx. 01 /0 L-L-L I duit			1 722-1-1	(SCA)	1.732	«L«I(SCA)		

Sub-transient Reactance Per Unit,Xd"=0.125

For low resistance Percent Impedance≈12.5%

Percent Reactance data is found from Generator

datasheet of Model No: PG345B3

Factor,
$$f = \frac{1.732*L*I(SCA)}{N*C*E(L-L)}$$

Factor, f =
$$\frac{1.732*L*I(SCA)}{N*C*E(L-N)}$$

I(SCA)= Short Circuit Current at the beginning of the circuit

L=Length of Cable

N=No. of Conductor Per Phase

C=Conductor factor(One over the impedance per foot)

E(L-L)=Phase to Phase Voltage or L-L Voltage

E(L-N)=Phase to Neutral Voltage or L-N Voltage



Electrical Calculation



CONSORTIUM OF ZICOM EQUIPMENT PTE LTD.



BANGLADESH PETROLEUM EXPLORATION & PRODUCTION CO. LTD.	Sheet	ZICOM SINOPEC PETROLEUM ENGINEERING CORPORATION						
USER						240-0214-EMEL-CS00-000		
LOCATION	SRIKAIL GAS FIELD, BA				DOC NO SERVICE	FAULT LEVEL CALCULATION		
PROJECT	· · · · · · · · · · · · · · · · · · ·			NATURAL GAS PLANT	TAG NO			
JOB NO	240		DETIDITATION THE NATIONAL GAOT EART					
					QUANTITY			
Generator KVA Rating	345	kVA	-					
Line to Line Voltage			-					
Line to Neutral Voltage								
Full Load Ampere			-					
Genset Alternator Percentage								
Impedance	126	%						
			-					
			-					
Fault at your distance/towning!	 			Coult at your distance to region	T			
Fault at zero distance/terminal			<u> </u>	Fault at zero distance/terminal	<u> </u>			
=			<u> </u>	=				
Full Load Ampreres				Full Load Ampreres	498			
Multiplier,M1			<u> </u>	Multiplier,M1	8			
Fault at Generator terminal	3984			Fault at Generator terminal	5976			
L-L Fault	3.98			L-N Fault	5.98	kA		
L-L-L Fault(AFC)	4.58	kA						
F. BUSDAD ODGUD OAD								
For BUSBAR GROUP C&D					T			
	<u> </u>							
Fault at some distance from terminal				Fault at some distance from terminal				
Distance from terminal, L		ft		Distance from terminal, L	. 820	ft		
No. of Conductor,N				No. of Conductor,N				
Conductor factor,C				Conductor factor,C				
Factor,f	17.7041		<u> </u>	Factor,f	53.331			
Multiplier,M2	ļ			Multiplier,M2	0.0184			
Fault after 1st distance	214		<u> </u>	Fault after 1st distance	109.96			
L-L Fault	0.21	kA		L-N Fault	0.11	kA		
L-L-L Fault(AFC)	0.25	kA						
Note		Formula						
Reff. Drawing: 240-0214-EMEL-DW00-000 DISTRIBUTION SYSTEM	For L-L Fault For L-N Fault							
For conductor factor, C reff. document is	FLA _{L-L} =	WA Rating:	$\frac{*1000}{gs} \qquad \qquad FLA_{L-N} = \frac{KVARa}{L-NV}$	ting*1000				
FLA=Full Load Ampere			L-LVolta					
AFC=Available Fault Current		Multiplie	r M1 = -	100 Multiplier, M2 =	1_			
I -I Fault=Approx. 87% I -I -I Fault	Multiplier, M1 = $\frac{100}{\% Percent Impedence}$ Multiplier, M2 = $\frac{1}{1+f}$							
L auii_/\UUIUX. 0/ /0 L-L-L Fauii								

L-L Fault=Approx. 87% L-L-L Fault

Sub-transient Reactance Per Unit,Xd"=0.125

For low resistance Percent Impedance≈12.5%

Percent Reactance data is found from Generator

datasheet of Model No: PG345B3

Factor,
$$f = \frac{1.732*L*I(SCA)}{N*C*E(L-L)}$$

Factor,
$$f = \frac{1.732*L*I(SCA)}{N*C*E(L-N)}$$

I(SCA)= Short Circuit Current at the beginning of the circuit

L=Length of Cable

N=No. of Conductor Per Phase

C=Conductor factor(One over the impedance per foot)

E(L-L)=Phase to Phase Voltage or L-L Voltage

E(L-N)=Phase to Neutral Voltage or L-N Voltage



Electrical Calculation Sheet



CONSORTIUM OF ZICOM EQUIPMENT PTE LTD. AND



EXPLORATION & PRODUCTION CO. LTD.	Sheet		ZICOM SINOPEC PETROLEUM ENGINEERING CORP			SMOREC		
JSER	BANGLADESH PETRO	EUM EXPLORATION & PRODUCTION CO. LTD.			DOC NO	240-0214-EMEL-CS00-000		
LOCATION	SRIKAIL GAS FIELD, BA	ANGLADES	Н		SERVICE	FAULT LEVEL CALCULATION		
PROJECT	60 MMSCFD SILICA GE			NATURAL GAS PLANT	TAG NO			
JOB NO	240				QUANTITY			
Generator KVA Rating	345	kVA						
Line to Line Voltage	400	V						
Line to Neutral Voltage	230	V						
Full Load Ampere	497.98	Α						
Genset Alternator Percentage Impedance	12.5	%						
Fault at zero distance/terminal				Fault at zero distance/terminal				
					†			
Full Load Ampreres	498	Δ		Full Load Ampreres	498	Δ		
Multiplier,M1				Multiplier,M1		,		
Fault at Generator terminal	3984	Α		Fault at Generator terminal		A		
L-L Fault	3.98			L-N Fault	5.98			
L-L-L Fault(AFC)	4.58							
For BUSBAR GROUP E								
Fault at some distance from terminal				Fault at some distance from terminal				
Distance from terminal, L	20	ft		Distance from terminal, L	_ 20	ft		
No. of Conductor,N	1			No. of Conductor,N	1			
Conductor factor,C	981			Conductor factor,C				
Factor,f	0.3517			Factor,				
Multiplier,M2				Multiplier,M2				
Fault after 1st distance	2948			Fault after 1st distance				
L-L Fault	2.95	kA		L-N Fault	2.9	kA		
L-L-L Fault(AFC)	3.39	kA						
Note		Formula						

Reff. Drawing: 240-0214-EMEL-DW00-0008 POWER DISTRIBUTION SYSTEM

For conductor factor, C reff. document is attached

FLA=Full Load Ampere

AFC=Available Fault Current

L-L Fault=Approx. 87% L-L-L Fault

Sub-transient Reactance Per Unit,Xd"=0.125

For low resistance Percent Impedance≈12.5%

Percent Reactance data is found from Generator

datasheet of Model No: PG345B3

For L-L Fault

$$FLA_{1-L} = \frac{KVARating*1000}{L-LVoltage}$$

$$\mathsf{FLA}_{\mathsf{L-N}} = \frac{\mathit{KVARating} {*} 1000}{\mathit{L-NVoltags}}$$

Multiplier, M1 =
$$\frac{100}{\% Percent Impedence}$$

Multiplier, M2 =
$$\frac{1}{1+f}$$

For L-N Fault

Factor,
$$f = \frac{1.732*L*I(SCA)}{N*C*E(L-L)}$$

Factor, f =
$$\frac{1.732*L*I(SCA)}{N*C*E(L-N)}$$

I(SCA)= Short Circuit Current at the beginning of the circuit

L=Length of Cable

N=No. of Conductor Per Phase

C=Conductor factor(One over the impedance per foot)

E(L-L)=Phase to Phase Voltage or L-L Voltage

E(L-N)=Phase to Neutral Voltage or L-N Voltage