

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
		January						
1		Sharqiya 01/01/05	1)132kV Al Kamil S/S 132kV JBB Ali Ckt-1 2) 132/33/11kV JBB Ali S/S 132kV CB & 33kV incomers s of 125MVA TX-1	1. Distance Relay,Zone-1, A-phase 2. Master Trip relay Cause: Transient fault Weather: Rainy	4:08	ARC 04:18	Nil	At Al Kamil end line autoreclosed and manually closed at JBB Ali S/S. System back to normal at 04:18hrs.
2		Sharqiyah 01/01/05	132 kV Al Kamil & 132/33/11 kV Mudairib Grid station. 132 kV Al Kamil - Mudhairib ckt - 2.	Al Kamil S/S: Main Protection, Distance Relay A,B,C ,Zone -1[A-phase] Mudairib S/S: Main Protection,Distance Relay ABC, Zone-2, A-phase, Cause: Transient fault Weather: Rainy	4:46	ARC	Nil	Line autoreclosed from both ends
3		Sharqiyah 02/01/05	132kV Al Kamil S/S: 132kV JBB Ali Fdr-2 132/33/11kV JBB Ali S/S: 132kV & 33kV I/C CB's of 125MVA TX-2	<u>Al Kamil S/S:</u> Main protection operated, ARC initiated on, Dist. Relay,Zone-1,A phase, Fault location 40.13 kM <u>BB Ali S/S:</u> Master trip relay 1&2 Cause: under investigation	4:56	ARC 05:03	NIL	CB autoreclosed at Al Kamil S/S & manually closed at JBB Ali S/S.
4		Dhakhliya 05/01/05	Manah PS & Nizwa S/S 132kV Manah-Nizwa Circuit-2	Dist. Relay, Zone-1, B-N, Main Protection, Inter Trip Received, A/R operated (same indications on both sides) Cause: Under investigation	23:58	ARC	Nil (line-1 in service)	Circuit tripped from both sides and autoreclosed.
5		Sharquiah 08/01/05	132kV Al Kamil Grid S/S & 132/33/11 kV JBB Ali SS: 132kV Al Kamil - JBB Ali Ckt - 1	Al Kamil S/S: Dist. Relay, Zone - 1, A-N JBB Ali S/S: Master Trip Relay - 1 & 2	22:45	ARC 23:06	Nil	Autoreclosed at Al Kamil and Manually closed at JBB Ali SS.
6		Sharqiya 15/01/05	132kV Al Kamil S/S & 132/33/11kV JBB Ali S/S 132kV Al Kamil-JBB Ali circuit -2	Al Kamil S/S: Dist. Relay, Zone-1, A-phase,A/R initiated JBB Ali S/S: Master Trip Relay 1 & 2	5:39	ARC 05:54	Nil	Line autoreclosed at Al Kamil S/S and manually closed at JBB Ali S/S.
7		Muscat 16/01/05	132/33/11 kV Mawallah SS 132 & 33 kV CBs of 125 MVA TX - 2	O/C Cause: TX-2 tripped during the upgrading works of K-series O/C relay.	13:29	13:39	Nil	At 13:39 hrs 125MVA Tx -2 normalized.

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8		Sharqiya 16/01/05	132kV Al Kamil S/S & 132/33/11kV JBB Ali S/S 132kV Al Kamil-JBB Ali Line-1	Dist. Relay, Zone-1,A,B,C A/R operated	22:45	ARC 23:07	Nil	At Al Kamil S/S line autoreclosed and manually closed at JBB Ali S/S.
9		Muscat 17/01/05	132/33/11 KV Al Falaj Grid station 33KV I/C 1TOB of 125 MVA TX -1	Trip Relay Cause: Unknown	11:17	11:53	Nil	I/C CB closed at 11:53 hrs and system back to normal.
10		Sharqiya 19/01/05	1)132kV Al Kamil S/S 132kV Sur line-1 2)132/33/11kV Sur S/S 132kV & 33kV I/C CB's of 125MVA TX-1	Dist. Relay, Zone-1, R-phase, A/R operated Cause: Momentary fault	1:27	ARC 01:32	Nil	At Al Kamil S/S line auto reclosed and manually closed at Sur S/S.
11		Sharqiya 21/01/05	1) 132kV Al Kamil S/S 132kV JBB Ali Fdr-2 2) 132/33/11kV JBB Ali S/S 132 & 33kV CB's of 125MVA TX-2	Distance Relay, Zone-2, A-phase, A/R lockout	0:57	02:14 02:18	Nil	At 02:14hrs line closed at Al Kamil S/S. At 02:18hrs TX-2 closed at JBB Ali S/S and system back to normal.
12		Sharqiya 29/01/05	132kV Al Kamil S/S & 132/33/11kV Sur S/S 132kV Al Kamil-Sur line-2	Al Kamil S/S: Dist. Relay,Zone-1,A-phase, A/R lockout Sur S/S: Trip Relay 1 & 2	1:09	01:24 01:54	Nil	At 01:24hrs line closed from Al Kamil S/S. At 01:54hrs TX-2 energised at Sur S/S and system back to normal.
		February						
13		Sharqiya 01/02/05	132/33kV Al Kamil S/S & 132/33/11kV JBB Ali S/S 132kV Al Kamil- JBB Ali line-2	Al Kamil S/S: Dist. Relay, Zone-2, B-phase, A/R lockout, loc:57.82kM JBB Ali S/S: Master Trip Relay 1&2	2:39	03:30 03:32	Nil	At 03:30hrs feeder closed at Al Kamil S/S. At 03:32hrs closed at JBB Ali S/S and system normalised.
	1	Barka PS 02/02/05	Barka PS GT -2 ST	GT -2 - Automation system fail ST - Hand tripped	19:09 19:10	20:33 21:47	Nil	GT -2 synchronized at 20:33 hrs ST -1 synchronized at 21:47 hrs (GT -1 was on standby)
14		Sharquiyah 22/02/05	132/33/11kV Mudhaibi S/S & 132/33/11kV Mudhairib S/S 132KV Mudhibi - Mudhairib Ckt -1	Mudhairib S/S: Distance Relay, Zone-1, A-phase,loc-17.3kM Mudhaibi S/S: Distance Relay, Zone-1, A-phase loc-48.08kM	1:41	ARC	Nil	Feeder autoreclosed at both ends and system back to normal.
15		Sharquiyah	132/33/11kV JBB Ali S/S & 132KV Al Kamil S/S 132kV Al Kamil-JBB Ali ckt-2	Under investigation	5:41	ARC 06:07	Nil	CB autoreclosed at Al Kamil Grid and manually closed at JBB Ali s/s.

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16	2	Muscat 27/02/05	1. 220/132/33kV MSQ S/S: a) 132kV CB of 500MVA TX-2 b) 132kV Jahloot line-1&2 2. 132/33kV Jahloot S/S: 132kV & 33kV CB's of 125 MVA TX-1 &2 3. 220/132kV Filayj S/S: 220kV Filayj-MSQ line-2	1.a) Differential Relay-2 & Master Trip relay b) Distance Relay,Zone-2, B-phase 2. O/C & E/F Relay 3. Master Trip Relay Cause: Above tripping occurred during rain,thunder and lightning in Muscat & Batina areas. 220kV Filayj-MSQ line-2 still open and under investigation. Further investigation on 28/2/05 revealed two cable termination flash overs on 33 kV Seh Al Dhabi fdr-2.	19:02	19:51 19:58 20:06 20:23	All areas fed from Jahloot S/S (Quriyat, Seh al Dhabi, Mazara, Al Nahda, Wadi Hatat) affected from 19:02hrs to 20:06hrs. Loads on Seh Al Dhabi-2 affected till 21:10hrs (Wadi Hatat, Shabiya)	At 19:02hrs 220kV Filayj-MSQ line-2 and 132kV MSQ-Jahloot line-1&2 were tripped same time both ends of each circuits. At 19:51hrs 132kV Jahloot -1 charged at MSQ S/S and 125MVA TX-1 charged Jahloot S/S. At 20:06hrs closed all 33kV feeders except 33kV Seh Al Dhabi - 2 (Not holding when charged). This load shifted to Seh Al Dhabi-1 at 21:10hrs. At 20:23hrs 132kV Jahloot-2 closed & 125MVA TX-2 charged at Jahloot S/S. At 20:50hrs Filayj-MSQ line-2 closed from Filayj S/S. But it tripped again while closing 132kV CB of 500MVA TX-2 at MSQ S/S. Now line kept open from both sides and will be energised after line patrolling & investigation.
17		Sharquiah 28/02/05	132/33/11 kV Mudhaibi and Mudairib Grid SS 132 kV Mudhaibi - Mudhairib ckt 2	Mudhaibi: Distance Realy Zone-1,'A' Phase. Mudhairib: Distance Relay ,Zone -1, 'A' Phase Weather: Rain	3:37	ARC	Nil	Feeder auto reclosed both ends.
18	3	North Batinah (28/02/05)	132/33 KV Sohar Grid & 132kV Wadi Jizzi PS 132kV Wadi Jizzi-Sohar Line-1 &2	<u>At Sohar S/S:</u> Line-1: Distance Relay, Zone-1, A,B,C Phase, Fault location-13.27kM Line-2: Distance Relay, Zone-1,A,B,C phase, Fault location-11.42kM <u>At Wadi Jizzi PS:</u> Line 1&2: Distance Relay, Zone-1, A Phase, D.O.C Cause: Due to Rain, Thunder &lightining	5:29	05:53 06:02	No area affected (Due to tripping Sohar S/S isolated from Wadi Jizzi PS but remained unaffected. Bus voltage reduced upto 120kV since feeding was from Khabourah side)	Wadi Jizzi Sohar Fdr 1 & 2 were tripped at both ends. Line-1 autoreclosed at Wadi Jizzi P/S. Line- 2 autoreclosed at Sohar S/S. At 05:53Hrs line- 1 was sychronised at Sohar S/S. At 06:02 Hrs line-2 synchronized at Wadi jizzi PS and and system is back to normal.

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19		South & North Batinah (28/02/05)	132/33 KV Muladha and Khaburah S/S 132KV Khaburah- 1 & 2	Mulladah Main: Line-1&2: Dist. Relay,GFC-STFWL-1 Khabourah S/S: Distance relay, GFC-STFWL1 Cause: Due to rain	7:32	13:12 16:52	Nil	Patrolled lines thoroughly and no visible cause found. At 13:12hrs closed line-1 &2 from Muladhah main. Line-1 synchronised at Khabourah S/S. Tried to closed line-2 at Khabourah S/S but it was not getting closed. At 13:53hrs opened line-2 from Muladhah S/S. At 16:45hrs closed line-2 from Khabourah S/S after rectifying closing problem. Line-2 synchronised at Muladhah S/S at 16:52hrs and system back to normal.
20	4	Dahirah (28/02/05)	132/33kV Ibri & Dank Grid S/S 1) 132kV Ibri-Dank Line-1 &2 2) 132kV Ibri-Dank Line-1&2	Distance Relay Cause: Found B-phase surge arrestor of line-2 flashed over at Ibri S/S Gantry . Weather: Heavy Rain and Lightning	1) 07:27 2) 13:08	ARC 13:15 13:22 18:31	Nil Ibri-Dank line-1 tripped when test charged line-2, Wadi Jizzi Grid was separated due to the outage of 132kV Muladhah-Khabourah lines. Under Frequency tripping occurred in system.	Ibri-Dank line-1 autoreclosed. Arranged line patrolling for line-2. At 13:08hrs line-2 test charged but tripped along with line-1 again. On investigation found B-phase surge arrestor of line-2 flashed over at Ibri S/S Gantry. At 13:15hrs line-1 closed and supply normalised to all 33kV Feeders which was tripped on U/F. At 18:31hrs energised Ibri-Dank line-2 after repair jobs and system back to normal.
21	5	Dahirah (28/02/05)	132/33 KV Ibri Grid S/S 1) 132/33KV 63 MVATX - 1 (132 & 33 kV CBs) 2) a. 132/33KV 63 MVATX - 1 (132 & 33 kV CBs) b. 33 kV Dreez feeder	1) O/C 2) a. DOC b. O/C & E/F	1) 07:37 2) 09:24	08:07 09:37 19:40 20:50	MOD, Dreez and Wali	1) TX - 1 charged at 08:07 hrs and supply normalised. 2) At 09:24hrs TX-1 tripped again along with 33kV Dreez feeder. TX-1 energised at 09:37 hrs. 3) Dreez feeder closed without load at 19:40 hrs. Load normalised at 20:50hrs
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22	6	Muscat 03/03/05	1) 132/33/11 kV Wadi Adai S/S: 132KV Wadi Kabir Ckt-2 132/33/11 kV Wadi Kabir S/S: 33 kV I/C CB's of 125 MVA TX-2 on Bus-1 & Bus-2 2)220/132/33/11 kV MSQ S/S: 132KV Wadi Adai Ckt- 1&2 (Tripped only at MSQ S/S)	1) Wadi Adai S/S Distance Relay ,Zone -1, R- phase,SOTF & ARC lockout Wadi Kabir S/S Inter Trip Received 2) MSQ S/S Distance Relay, B-phase and ARC initiated for both Ckts Cause: R-Phase 132 kV Cable faulty near Wadi Kabir S/S.	18:27	2) ARC	Nil	132kV Wadi Adai -Wadi Kabir line-2 tripped from both sides. 132kV MSQ-Wadi Adai line- 1&2 tripped only at MSQ S/S and autoreclosed. At 22:48hrs 132kV Wadi Kabir line-2 charged from Wadi Adai S/S after opening cable jumper at last tower & held ok. Manually opened feeder to find suspected cable fault. Fault located on R-phase cable Arrangements to repair the cable are in progress.
23		Dhahirah 06/03/05	132/33/11 KV Dank Grid S/S 132 & 33 KV CB of 15MVA Tx 1	Differential protection and trip relay Cause: Rain and lightning	14:05	15:00	Nil	At 15:00 hrs TX-1 normalized
24		Dhahirah	132/33/11 KV Dank Grid S/S 1. 132 & 33 KV CB of 15MVA Tx 1 2. 33KV Mazim Feeder	1. LV-DEF and Trip relay 2. O/C and E/F Cause:Rain and lightning	15:42	1)20:23 2)15:55	2)Mazim area	On inspecting the TX 1,nothing found abnormal. TX 1 charged and held ok.
25		Dhahirah	132/33/11 KV Dank Grid S/S 132 KV Al Hail Feeder	Distance protection and trip relay Cause: Rain and lightning	16:26	ARC	Nil	Feeder Autoreclosed
26		Muscat 09/03/05	132/33/11 kV Bousher Grid SS 132 & 33 kV CBs of 125 MVA TX - 2.	<u>Alarm Panel Indications</u> Buchholz trip Backup Protection operated VT fail Cooler supply out of step Cause: Found water particles in Buchloz relay marshalling box.	2:18	12:13	Nil	Water particles removed. Transformer protection system checked fully and charged at 12:13 hrs.
27		Muscat	Rusail PS 132 kV Mawalleh ckt - 1	To check the cause of CB Hydraulic oil pressure high alarm	2:05	3:03	Nil	CB closed after checking the Hydraulic system.
28		Muscat 10/03/05	Rusail PS 132 kV Mawalleh ckt - 1	To rectify the CB Hydraulic oil pressure high alarm	8:08	12:09	NIL	CB closed after rectificaton.

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29		Muscat 11/03/05	132/33/11 kV Bousher Grid SS 132 & 33 KV CBs of 125 MVA TX -2	<u>Alarm panel Indications</u> Buchhloz trip Backup Protection operated VT fail Cooler supply out of step Cause: Found water particles in connecting cable between Buchhloz relay and marshalling box.	4:24	12:21 15/03/05	Nil	Transformer kept open to replace the Cable.
30		North Batina 19/03/05	132/33kV Sohar S/S and 132/33kV Khabourah S/S 132kV Sohar -Khabourah line-2	<u>Sohar S/S:</u> Distance Relay, Zone-1 C-phase, Fault loop: L3-N, Fault location: 59.2kM <u>Khabourah S/S:</u> Distance Relay, Zone-1, C-phase,FL-40.22kM ITS Relay, BFR - Trip indication	02:41 (19/03/05)	ARC 03:06 (19/03/05)	Nil	At Sohar S/S feeder autoreclosed. At 03:06hrs feeder synchronised at Khabourah S/S and system back to normal.
31	7	Dahairah 20/03/05	132/33/11KV lbri S/S & Nizwa S/S 1)132KV Nizwa -lbri ckt -1 2) 132 kV Nizwa -lbri ckt-2 3)132kv Dank ckt - 2	1& 2) lbri S/S: Auto recloser check syn-relay Nizwa S/S: Main protection , inter trip receive , ARC locked out and trip locked out 3) Distance protection Cause: Transient fault To be investigated	4:54	1)06:00 2) 05:15 3) 05:50	NIL	Line patrolled and nothing found abnormal. At 05:15 hrs Nizwa ckt -2 normalized At 05:50 hrs Dank ckt -2 normalized At 06:00 hrs Nizwa ckt-1 normalized
32		Dhahirah 21/03/05	132/33/11 kV lbri Grid SS 132 kV Dank Fdr - 2	Inter trip receive, Trip and lock out relay Cause: During SCADA testing at Dank SS	9:51	9:58	Nil	Manually closed the feeder at 09:58 hrs.

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33	8	Muscat 22/03/05	1) 132/33/11 kV Wadi Adai S/S 132KV Wadi Kabir Ckt - 1	Distance Zone -1 (B- phase) ARC lockout Cause: B - Phase cable fault at Wadi Kabir end	7:59	08:42 09:17 10:00 10:45 11:30 12:00	All areas feeding from Wadi Kabir SS - Wadi Kabir Residential, Commercial and industrial areas, Muscat, Muttrah Business areas, Riyam and some parts of Ruwi commercial area	At 08:29 hrs All 33KV feeders and I/C's of 125MVA TX-1 manually opened At 09:34 hrs 132KV Ckt -1 trail charged but tripped with same indication. 09:55 hrs Isolated B- phase cable by opening jumper from tower -24 & connected Jumper at tower -25 between B- phase cable of line -1 to O/H line -2 and at 14:03 hrs temporary arrangement was done at W.Kabir SS by making jumper between B- phase line -2 directed to B-phase of isolator Switch of 125MVA TX-1. At 14:03 hrs 132 kv Ckt-1 charged from W.Adai SS and supply normalized to Ruwi Market pri S/S and CBD South pri S/S at 14:21 hrs <u>Note:</u> No tripping occur at W.Kabir S/S Arrange back feed for Riyam & Old Airport substations from Al Falaj Grid S/S
34		Sharquiyah 23/03/05	132/33/11kV Mudhaini S/S & Mudhaibi S/S 132kV Mudarib- Mudaibi circuit-2 at Both ends (Mudharib S/S & Mudhaibi S/S)	<u>Mudarib :</u> Distance Zone-1, fault location-17.91km <u>Mudaibi :</u> Distance Zone-1 fault location - 50.74 km Cause:Transient fault Weather: Heavy wind.	23:52	ARC	NIL	Feeder autoreclosed at both ends
		April						

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35	9	Muscat 01/04/05	132/33/11 kV Wadi Adai S/S: 132KV Wadi Kabir Ckt-1 132/33/11 kV Wadi Kabir S/S: 1. 125MVA TX-1 2. 33kV Muscat-1 3. 33kV Ruwi Market-1 4. 20MVA TX-2	As per Switching Schedule - 110/05 To energise 132kV Wadi Kabir-2 after repairing its R-phase cable. Circuit-1 was in service using B-phase cable of Circuit-2. 33kV Feeders and TX-2 were manually opened to restrict load at Wadi Kabir S/S as the Station was fed from Al Falaj S/S through 33kV feeders. (Circuit-1 will be normalised after repairing B-phase cable)	06:34 06:31 06:31 06:32	08:54 07:06 07:10 07:20	Part of Muscat and Muttrah areas	At 06:31hrs opened 33KV Muscat -1 and 20MVA TX-2 to restrict load at Wadi Kabir S/S as it was fed through 33kV Old Airport 1 & 2 and CBD 1 & 2 feeders from Al Falaj S/S. At 07:06hrs & 07:10hrs 33kV Feeders and 20MVA TX-2 were closed after verifying load demand at Wadi Kabir S/S was in limit. 132kV Wadi Kabir Circuit-1 isolated from both sides and taken for cable repair jobs. 132kV Wadi Kabir Circuit -2 put back in service at 08:54hrs and load shifted back.
36		Muscat 02/04/05	1) 220/132 kV Filayj S/S: 220 kV MSQ ckt - 2 2) 220/132/33/11 KV MSQ S/S: 132 KV CB of 500 MVA TX -2	1) Master Trip relay 2) Nil Cause: Under investigation. Tripping occurred while down loading the Differential Relay -2 event records by supplier.	10:31 12:58	12:06 12:55 13:16	Nil	220 kV CB closed at 12:06hrs. At 12:55 hrs 132 kV CB of 500 MVA TX - 2 charged. While checking the TX control circuit Feeder tripped again at 12:58hrs. At 13:16 hrs 220 kV CB of MSQ fdr closed at Filayj Grid station. 132 kV CB at M S Qaboos kept open to investigate the problem. (Now Tx is charged from 220 kV side but 132 kV side is open)
37	10	South Batina 03/04/05	132/33kV Muladhah S/S 132KV CB & 33kV I/C (2TOB) of 125MVA TX-2	Master Trip Relay 1 & 2 O/C, R & Y 33kV Billah-2: Distance Relay, Zone-2, 3&4, Trip Relay TA, O/C, E/F (Feeder did not trip) Cause: Two nos. lightning arrestor found failed at loc: MJ-A-35 but feeder CB not tripped.	11:40	11:51 12:35	All area fed from 33kV Bus-2 affected upto 11:51hrs. Part of Billah area affected upto 12:35hrs.	At 11:51hrs 33kV I/C (2TOB) of TX-2 closed supply normalised to all 33kV Feeders except Billah-2. At 12:35hrs closed 33kV Billah-2 feeder after opening jumper of failed lightning arrestors and supply back to normal.
38		Sharqiya & Dhakhliya 12/04/05	132/33/11kV Mudhaibi S/S & 132/33/11kV Izki S/S 132kV Mudhaibi-Izki line-2	<u>Mudhaibi S/S:</u> Distance Relay, Zone-1, A,B,C-phase, location-37.81kM <u>Izki S/S:</u> Distance Relay, Zone-1, A,B,C-phase, location-38.7kM Cause: Momentary fault	4:23	ARC	Nil	Feeder auto reclosed at both ends and system back to normal.

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39	11	Muscat 13/04/05	132/33/11 kV Wadi Adai S/S 132KV Wadi Kabir Ckt-1	Distance Zone -1 (R-N) phase, Trip relay Cause: Found Red phase cable faulty	14:12	14:44 to 15:15	Part of Ruwi Market , Part of Muttrah, Riyam area, Part of Hamriya , Muttrah- Business District ,W. Kabir - Residential, Commercial and Industrial Areas (Wadi Kabir Grid station lost supply because circuit-2 was also shut down earlier for hand cleaning works)	Hand cleaning work stopped, permit cancelled & 132KV Wadi Adai-Wadi Kabir circuit-2 normalised at 14:44 hrs. Opened 33 KV feeders one by one at Wadi Kabir Grid Station. At 14:46 hrs Charged 33 KV Riyam 1 & 2,Muscat -1. At 14:47 hrs charged 33 KV Incomer C.B of TX -4. At 14:49 hrs charged 33 KV Ruwi Market 1 & 2 ,MBD South -1. At 15:15 hrs charged 33 KV MBD South -1. Load of some 11 KV feeders shifted to Al Falaj Grid Station.
40		North Batina 19/04/05	1. Wadi Jizzi PS 132kV Shinas Feeder 2. OMCO PS 11kV CB of 11/66 kV TX-1	1. Dist. Relay, Zone-1, A,C phase, Inter Trip Send 2. Distance Relay, B-E Cause: Rain, wind & lightning	14:20 15:11 14:20	ARC ARC 14:43	Nil	Feeder autoreclosed both times and supply normalised. At 14:43hrs 11kV CB of TX-1 closed at OMCO and system back to normal.
41	12	Dhahirah (19/04/05)	132/33kV Al Wasit S/S & 132/33kV Buraimi S/S 132kV Al Wasit-Buraimi line-1 (3 times tripped)	<u>Al Wasit S/S:</u> Dist. Relay, A,B,C phase, A/R operated <u>Buraimi S/S:</u> Dist. Relay, A,B,C phase, Aided trip Cause: Rain, wind & lightning	14:39 16:09 16:47	ARC 15:15 16:20 16:57	Nil	Line auto reclosed at Wasit S/S. At 15:14hrs line-1 manually opened from Al Wasit S/S and closed at Buraimi S/S (due to closing problem at Buraimi S/S) At 15:15hrs line-1 closed at Al Wasit S/S. At 16:09hrs & 16:47hrs line-1 tripped from Buraimi S/S and normalised at 16:20 & 16:57hrs respectively.
42	13	Dhahirah (19/04/05)	132/33/11kV Ibrri S/S 132/33kV 63MVA TX-1	O/C & E/F Note: Found O/C, R & B phase, Trip Circuit faulty indication on 33kV Dreez feeder but not tripped. Cause: Rain, wind & lightning	15:03	15:20	MOD, Dreez, Wali Office (All feeders fed from 33kV Bus-1 affected)	At 15:18hrs 33kV Dreez feeder manually opened and closed 33kV Bus Coupler & supply normalised through TX-2. At 15:45hrs TX-1 closed. At 15:53hrs 33kV Bus Coupler opened. 17:03hrs Dreez feeder closed after line patrolling.

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INCIDENTS & SIGNIFICANT INCIDENTS

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43	14	Dhahirah (19/04/05)	132/33/11kV Dank S/S and 132/33 KV Al Wasit S/S 1. 132kV Dank-Al Wasit line-1(only at Dank S/S) 2. 132kV Dank-Al Wasit line-2(both sides)	Dank S/S Line-1: O/C, & E/F Line-2: Distance Relay, Zone-1, A,B,C phase Al Wasit S/S: Line-2 : Dist. Relay, Zone-1, A,B,C phase, A/R lockout, Master Trip Relay Cause: Rain,wind & lightning	1) 16:09 2) 16:11	1) 16:59 2) 17:21	Nil	At 16:09hrs line-1 tripped only from Dank side and which was closed at 16:59hrs. At 16:11hrs line-2 tripped from both sides and it was normalised at 17:21hrs.
44	15	Dhahirah (19/04/05)	132/33/11kV Dank S/S 1. 132/33 kV 15MVA TX-1 2. 132/33 kV 15MVA TX-2 3. 33kV Bukraba feeder 3. 33kV Cap. Bank-1	1. Differential Relay, A,B,C phase (LV REF during 2nd trip) 2. Differential Relay, A,B,C phase 3. Cause: Rain,wind & lightning	16:25 17:44	16:34 17:00 19:33	All areas fed from Dank S/S	At 16:34hrs TX-1 energised and supply restored to all 33kV feeders. At 17:00hrs TX-2 normalised. At 17:44hrs TX-1 tripped again and closed at 19:33hrs.
45	16	Dhahirah (19/04/05)	132/33kV Al Wasit S/S 1.132/33 kV, 30 MVA TX-1 (only 33kV CB) 2. 132/33 kV, 30 MVA TX-2 (both sides) 3. 33kV Mahada feeder	1. Trip Relay, Ta,Tc 2. O/C, E/F & Master Trip Realy 3. Dist. Relay, Zone-1, A,B,C phase, E/F Cause: Rain,wind & lightning	16:47	17:54	All areas fed from Al Wasit S/S	At 17:53hrs TX-2 energised. At 17:54hrs TX-1 energised and feeders normalised one by one.
46		Sharquiyah 20/04/05	1)132 kV Al Kamil and JBB Ali Grid SS 132KV Al Kamil - JBB Ali Ckt -1 both ends 2)132/33/11KV JBB Ali Grid S/S 33KV I/Cs of 125MVA TX-1	1)Main Protection Distance 'B' Phase (no zone), Fault loc- 145.8 Kms 2)Master trip relay 1& 2 operated. Cause: Heavy rain & lightning.	17:06	17:20	NIL	Feeder auto reclosed at Al Kamil and manually closed at JBB Ali SS.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
47	17	South Batinah 21/04/05	1)132KV Mulladah - Filayj ckt - 2 both ends 2) 132/33 Mulladah Grid S/S 132KV & 33KV CBs of 125 MVA TX-1 & TX -2	1) Mulladah end: Distance relay, Zone-1, GFC, STF WL2, Location 1.3 KM. Filayj end: Distance relay , Zone -1 , Active Group - 1 started 'B ' phase, Trip phase A,B,C, Distance Zone-2 Aided trip, fault resistance 1.984 ohms, Location - 62.41 KM. 2) Mulladah S/S: <u>132KV side for both TXs</u> O/C relay <u>33KV side for both TXs</u> Trip relay 1 & 2 Cause: 'Y' phase lightning arrester flashed over during live line washing at Mulladah S/S Gantry.	7:45	08:15 09:31	Total area feeding from Mulladah SS	At 08:10 hrs manually opened all 33KV outgoing feeders and capacitor bank 1 & 2. At 08:14 hrs 125 MVA TX -1 charged and normalized all 33KV feeders on Bus 1 & 2. After isolated defective lightning arrester at 08:52 hrs 125 MVA TX-2 normalized and TX-1 incomer opened on Bus -2. At 09:31 hrs 132KV Ckt - 2 normalized .
		MAY 2005						
48		Dhahira 07/05/05	132/33/11KV Dank Grid S/S 1)132/ 33KV TX-1 (15MVA) 2)33KV Capacitor Bank-1 (5MVAR)	<u>132KV sides:</u> Differentiation protection <u>33KVside:</u> No indication 2 - O/ V Cause: Under Investigation	15:14	16:14	NIL	After inspection found TX OK, hence normalized it and charged Capacitor bank .
49		Sharquiya 08/05/05	132/33/11KV Mudaibi Grid S/S 132KV Mudairib Ckt -1	<u>Mudaibi end</u> Distance protection Zone-2, Trip phase ABC, <u>Mudairib end indication</u> Distance protection Zone-1,Trip phase ABC Cause: Momentum fault	4:34	ARC	NIL	Feeder autoreclosed
50		Dhahirah	132/33/11KV Dank Grid S/S 132/33KV TX-1 (15MVA)	TX-1 manually opened for Transformer maintenance	9:42	10:38	Nil	Transformer normalized at 10:38 hrs after maintenance work.
51		Dhahirah 09/05/05	132/33/11 kV Dank Grid SS 1) 132/33 kV TX - 1 (15 MVA) 2) 11 kV Feeder -1	1) Differential Protection Cause: Suspected relay problem 2) E/F Cause: During LLW in 11 kV feeder.	12:56	13:03 13:32	Nil Alaya (11 kV fdr)	Transformer and 11 kV feeder were tripped together. 11 kV feeder charged at 13:03 hrs and Transformer energized at 13:32 hrs.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
52		Dhahira 10/05/05	132/33/11KV Dank SS 132/33KV TX-1(15MVA)	TX-1 manually opened to check Differential relay	10:34	15:40	NIL	At 15:40 hrs 15MVA TX-1 normalized after work completed.
53	18	Muscat 11/05/05	1)132/33/11 kV Wadi Adai SS 132KV Wadi Kabir Ckt-1 2)132/33/11 kV Wadi Kabir SS 33 kV I/C's 1TOA & 1TOB of 125 MVA TX-1 3)132/33/11 kV MSQ SS 132KV Wadi Adai Ckt- 1&2	<u>Wadi Adai S/S</u> Distance Relay ,Zone -1, C- phase (Blue phase) , Trip Relay <u>Wadi Kabir S/S</u> Inter Trip Received <u>MSQ S/S</u> Distance Relay, A-phase, Zone-1 and ARC initiated for both Ckts Cause: Blue phase surge arrester flashed over at Wadi Kabir S/S and At 00:20 hrs (12/05/05) found Blue phase cable faulty near Al Maha filling station at Wadi Kabir area.	17:43	2- ARC	NIL	1- 132kV Wadi Adai-Wadi Kabir line-1 tripped both sides but Line-2 was in service and load not affected. 2- 132kV MSQ-Wadi Adai line-1 & 2 tripped only at MSQ S/S and autoreclosed. <u>Note:</u> During off time load flow through Rusail-Wadi Adai line-1 & 2 occurred and which helped system stability.
54		Dhahirah 17/05/05	132/33 kV Dank SS 132/33 kV 15 MVA TX -1	Differential protection	16:19	16:53	Nil (TX -2 in Service)	16:53 hrs TX -1 charged and system back to normal.
55		Dhahirah 18/05/05	132/33 kV Dank S/S 132/33 KV TX-1 (15MVA)	For protection relay testing	10:58	11:16	NIL	At 11:16hrs TX-1 charged after testing. Note :Bus Section closed and TX-2 was in service
56		Dhahirah 18/05/05	132/33 kV Dank S/S 132/33 KV TX-1 (15MVA)	For protection relay testing	14:02	14:14	NIL TX-2 was in Service	After testing ,fault rectified and TX-1 charged. Note : Bus Section closed and TX-2 was in service
57	19	South Batinah 19/05/05	132/33 kV Mulladah Main SS 125 MVA TX -1	1) Differential Protection (R & Y) 2) REF Cause: 33 kV cable termination and CT flashed over at 33 kV Bus -1 CB end.	14:54 15:44	16:25 16:56 17:45 18:17 18:36 19:08	Khadra, Thermad and Part of Rustaq, Musanah, Suweiq and Billah. (33 kV Bus -1 affected. Due to high load TX -1 & 2 were in radial)	At 15:35 hrs 132 kV CB closed and it was tripped while closing 33 kV I/C CB. After locating the fault TX -3 of Al Hazam SS load shifted from Rustaq -1 to Al Hazam fdr, TX -1 of Rustaq SS load shifted from Rustaq -1 to Rustaq -2 fdr and Thermad fdr load shifted to Bidaya fdr -3. Both ends of faulty cable isolated and TX -2 to 33 kV Bus -1 I/C closed at 18:16 hrs. All loads restored between 18:17 to 18:36 hrs. At 19:08 hrs TX -1 energised with 33 kV Bus -2 and TX -2 to Bus -2 CB opened.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
58	20	Dhahirah 24/05/05	132/33/11 kV Dank SS 15 MVA TX -1 &2	TX -1 LV REF Relay TX -2 Differential Protection Cause: 33 kV Cable joint and termination failure in TX -2 (Blue Phase)	13:17	14:11 22:17	Mazim, Sunaina and Dank	After identifying the fault TX -1 charged and supply restored to all affected areas at 14:11 hrs. Cable joint and termination were replaced. At 22:17 hrs TX -2 charged and paralled with TX -1.
59		Dhahirah 28/05/05	132/33/11KV Dank SS 132/33KV TX-1	To test Transformer protection relay	11:30	14:38	NIL	TX-1 charged after relay test.
JUNE								
60	21	South Batinah 12/06/05	1) 132 kV Filayj - Barka Main ckt -2 both ends 2) 220/132 kV Filayj SS 220/132 kV 500 MVA TX -1	1) 132 kV Ckt: Barka SS: DOC Filayj SS: Dist. Zone -1 (C -N) DEF -2. 2) 500 MVA TX-1 220 kV Side: O/C &E/F 132 kV Side: DOC & E/F Weather: Lightning and Rain	15:30	16:23 18:34	Nil	1) 132 kV Feeder autoreclosed at Barka end and Manually closed at Filayj end. 2) 500 MVA Transformer energized after checking.
61		Sharquiah	132 kV Al Kamil - Sur ckt -2 & 125 MVA TX -2 (HV & LV side CBs)	Al Kamil SS: Distance Zone -2 & ARC lock out Sur SS: Main protection Weather: Rain and lightning.	16:13	16:43 17:18	Nil	Both ends manually closed.
	22	Barka PS 20/06/05	Barka PS Plant trip (GT -1, 2 & ST)	Cause: Due to low fuel Gas pressure low	11:41	13:07 15:12 22/06/05 06:45	U/F trip activated. Many areas affected in different region.	20/06/05 Bark PS tripped with 452 MW Automatic UFLS - 229.4 MW 13:07 hrs GT -2 Synchronized. 15:12 hrs ST Synchronized. Maximum of 101.9 MW Sharquia Diesel generation utilized to reduce the load shed. Mximum load shed - 400 MW Load shed continued till 16:20 hrs. 21/06/05 Barka Generation - 245 MW Sharquiah Diesel used to meet system demand Maximum load Shed - 58.3 MW 22/06/05 06:45 hrs GT -1 Synchronized.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
62	23	Sharquiah 30/06/05	Al Kamil and JBB Ali Grid SS 132 kV JBB Ali Feeder -2 and 132/33 kV TX -2	Al Kamil : Dist. Zone -1 (R -N), Loc -17 km ARC initiated JBB Ali: Master trip relay -1 &2 Cause: Transient fault.	0:08	01:38 02:00	Entire feeding areas of JBB Ali SS. (TX -1 was not in service due to problem in Earthing TX Bushing)	Al Kamil end autoreclosed and JBB Ali end manually closed. 33 kV load restored from 01:47 to 02:00 hrs. Restoration delayed due to 132 kV CB closing problem at JBB Ali SS.
JULY								
63	24	Dhahirah 10/07/05	1) 132/33 kV Al Wasit S/S 132kV Buraimi ckt-1 &2 2) 132/33 kV Buraimi S/S 132kV Al Wasit ckt-2	1) Dist. Relay, Zone-2, A & C phase 2) Dist. Relay, Zone-1, A & C phase Weather: Wind, sandstorm and light rain	16:16	17:23 18:02	Entire Buraimi area	At 17:23hrs 132kV Feeder-1 and TX-1 energised. At 17:31hrs 132kV Feeder-2 and TX-2 energised. At 17:40hrs 33kV CB of TX- 1 closed and energised 33kV bus section. All 33kV feeders were closed from 17:43hrs to 18:02 hrs. At 18:00hrs 33kV CB of TX-2 closed and system back to normal.
64		Dhahirah 14/07/05	132/33 kV Al Wasit S/S & 132/33/11kV Dank S/S 132kV Al Wasit - Dank line-2	Al Wasit S/S: Distance Relay, Zone-1, A,B,C phase, O/ C Relay, A,B,C phase Dank S/S: Distance Relay, Zone-1, A,B,C phase. Cause: Suspect due to bad weather near Dank area.	16:00	16:23 16:33	Nil	At 16:23hrs feeder closed from Al Wasit S/S. At 16:33hrs feeder closed from Dank S/S and system back to normal. Patrolled line and nothing found abnormal.
65		Dhahirah	132/33/11kV Dank S/S & 132/33/11 kV Ibri S/S 132kV Ibri - Dank line-2	Ibri S/S: Distance Relay Dank S/S: Distance Relay, Zone-1, A,B,C phase. Cause: Due to heavy rain,wind & lightning in Ibri area.	17:22	17:38 17:42	Nil	At 17:38hrs feeder closed at Dank S/S. At 17:42hrs feeder closed at Ibri S/S and system back to normal.
66	25	Dhahirah 15/07/05	132/33 kV Al Wasit S/S & 132/33/11kV Dank S/S 132kV Al Wasit -Dank ckt-2 (Tripped two times)	<u>Al Wasit S/S:</u> Distance Relay, Zone-1, A,B,C phase, Master Trip Relay & A/R lockout <u>Dank S/S:</u> Distance Relay, Zone-1, A,B,C phase, A/R lockout. Cause: Heavy rain and wind near near Dank area.	16:42 17:24	16:59 17:06 17:40 17:43	Nil	At 16:59hrs feeder closed from Al Wasit S/S. At 17:06hrs feeder closed from Dank S/S. At 17:24hrs feeder tripped again from both sides. At 17:40hrs feeder closed from Al Wasit S/S. At 17:43hrs feeder closed from Dank S/S and system back to normal.
67		Dhahirah 23/07/05	132/33kV Al Wait S/S 1. 33kV incomer CB of TX-1 2. 33kV Mahada feeder	1. Trip Relay 2. Distance Relay, Zone-2, A,B,C phase, O/C L1 & L3 Cause: Due to heavy wind and lightning in Mahada area	16:07	16:27 16:37	No areas affected due to TX-1 tripping since 33kV bus coupler was closed.	At 16:27hrs TX-1 incomer closed. At 16:37hrs Mahada feeder closed and system back to normal.

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INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
68		Dhahirah 24/07/05	132/33 kV Al Wasit SS 1. 33 kV CB of 30 MVA TX -1 2. 33 kV Mahada Fdr	1. Trip Relay 2. Distance Zone -2,3 9A,B,C) Cause : Heavy wind & Lightning	13:58	14:38	Shuwayah, Al Khadrah, Al Juwaif, Mahadah, Al Afrath and Al Rowdha.	Both CBs manually closed.
69	26	Dhahirah 24/07/05	132/33 kV Al Wasit SS: 1. 132 kV Buraimi ckt -1&2 2. 132 kV Dank -1 132/33 kV Buraimi SS: 132 kV Al Wasit ckt -2	Al Wasit S/S: Buraimi -1: Dist. Zone-3 (A,B,C) & Dir O/C Buraimi -2: Dist. Zone -3 (A,B,C) & ARC lock out. Dank -1 : Dist.Zone -1 (A,B,C) Buraimi S/S: Al wasit -2 : Dist Zone -2 (A,B,C) & ARC lock out. Cause : Heavy wind and lightning.	14:01	14:24 14:33 14:27 14:31 14:35	Entire Buraimi area	From 14:24 to 14:33 hrs 132 kV feeders closed one by one. At 14:35 hrs 33 kV feeders were restored. During this trip fluctuation occurred and 158 MW load reduction in 33 & 11 kV system in Dhahirah.
		Dhahirah 24/07/05	132/33 kV Dank SS 132 kV Al Hail feeder	Nil Cause : Cloudy weather and Lightning	16:06	16:21	Entaire Al Hail and Yanqul area	Feeder closed and system normalized.
70	27	Dhahirah 25/07/05	1.132/33kV Al Wasit S/S a) 33kV incomer of 30MVA TX-1 b)132kV Buraimi ckt-1 c)132kV Dank ckt-1 2. 132/33 kV Buraimi S/S 132kV Al Wasit ckt-1 3. 132/33kV Al Wasit S/S 132kV Buraimi ckt-2 4. 132/33kV Al Wasit S/S 132kV CB of 30MVA TX-1	1. a) Trip Relay Ta,Tc b) Distance Relay, Zone-1(A,B,C) A/R lockout. c) Distance Relay (A,B,C) 2. Distance Relay, A& C phase, Zone-2 aided trip. 3. Distance Relay, Zone-1(A,B,C), Master Trip relay, A/R lockout Cause: Due to heavy rain,wind and lightning.	1)14:41 3)15:14 4)15:40	1. a)16:20 b)15:57 c)15:56 2. 16:02 15:57 15:41	Many areas in Batina & Dhahira region affected. Entire Buraimi area and many areas in Batina & Dhahira region affected.	At 14:40hrs 132kV Al Wasit -Buraimi line-1 tripped both sides. 132kV Dank line-1 and 33kV incomer of TX-1 tripped at Al Wasit S/S. At 15:14hrs 132kV Al Wasit -Buraimi line -2 also tripped and which caused complete power failure at Burami S/S. Due to voltage dip occured at 14:40hrs & 15:14hrs many 33kV & 11kV feeders were tripped in Batina, Dhakhliya & Dhahirah region. At 15:56 hrs 132 kV Dank fdr-1 closed at Al Wasit. At 15:57 hrs 132 kV Buraimi fdr-1 & fdr-2 closed from Al Wasit S/S At 16:02 hrs 132 kV Al Wasit -1 closed at Buraimi. At 16:07hrs all 33 kV feeders restored at Buraimi SS.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
71	28	Dhahirah 25/07/05	1.132/33kV Al Wasit S/S a)132kV Buraimi ckt-1 b)132kV Buraimi ckt-2 c)132kV Dank ckt-1 2. 132/33 kV Buraimi S/S 132kV Al Wasit ckt-1 3. 132/33 kV Buraimi S/S 132kV Al Wasit ckt-1 manually opened	1.a) Distance Relay, Start phase-A, Active Group-1, DOC, E/F & Trip Relay b) Distance Relay, Start phase-A, Active Group-1, DOC, E/F & Master trip Relay. c) Distance Relay, B-phase, DOC, E/F Trip Relay Ta,Tc 2. Distance relay 'A' phase, Dir E/F, trip relay Cause: Due to heavy rain,wind and lightning. Found one insulator broken and fell down in 132kV Al Wasit-Buraimi line-1.	17:33	17:54 17:56 17:58 18:02	Entire Buraimi area affected.	17:33 hrs 132 kV Buraimi line-1&2 and 132kV Dank line-1 tripped at Al Wasit S/S. At 17:54 hrs 132 kV Dank line-1 closed. At 17:56 hrs 132 kV Buraimi-1 & 2 closed. At 17:58 hrs 132 kV Alwasit -Buraimi line-2 closed and all 33 kV feeders restored. At 18:34 hrs 132 kV Al Wasit-Buraimi line-1 manually opened on finding one insulator broken and fell down. (conductor to earth clearance was less) . At 21:53hrs feeder normalised after repair jobs and system back to normal.
72		Dhahirah 25/07/05	132/33/11 kV lbri S/S and 132/33/11kV Dank S/S 132kV lbri- Dank line-2	Dank S/S: Distance Relay, Zone-1, A,B,C phase lbri S/S: Distance Relay, Zone-1, A,B,C phase & Inter trip received Cause: Cloudy weather and lightning	19:03	19:21 19:22	Nil	At 19:21hrs feeder closed at Dank S/S and At 19:22hrs feeder closed at lbri S/S.
73		Sharqiya 26/07/05	132/33kV Al Kamil S/S & 132/33kV Mudhairb S/S 132kV Al Kamil-Mudharib line-2 Station Auxiliary supply failed at Mudharib S/S, JBB Ali S/S and Sur S/S due to tripping of Auxiliary LT incomer breaker	Al Kamil S/S: Distance Relay, Zone-1, Start phase A & B, Tripped phase-A,B,C Mudhairib S/S: Distance Relay, Zone-1,Start phase A & B, Tripped phase-A,B,C Cause: Due to rain & wind in Mudhairib area.	17:23	ARC	Nil	Circuit -2 tripped at both sides and auto reclosed.At 17:38hrs Station supply normalised at Sur & Mudhairib S/S. At 18:00hrs Station supply normalised at JBB Ali S/S
74		Dhahirah 28/07/05	132/33kV Al Wasit S/S 132kV Buraimi line-1	Nil Cause: Under investigation	6:26	6:40	Nil	Line tripped only at Al Wasit S/S end. At 06:40hrs line closed from Al Wasit S/S and system back to normal.
		August						

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
75	29	North Batina 04/08/05	1. 132/33kV Sohar S/S a)132kV Khabourah ckt-1 b)125MVA TX-1 & TX-2 2. 132/33kV Khabourah S/S 132kV Sohar ckt-1	<u>Sohar S/S:</u> a) Distance relay, Zone-1, C-phase, location -5.61kM, ITS Relay b) Master Trip Relay, Dir. O/C, E/F, BFR Relay <u>Khabourah S/S:</u> Distnace Relay, ZM2 start, ZM3 start, Zcom Trip, fault loop L3N, Fault location- 83.3kM Weather: Humidity 87 %	3:26	04:00 04:09	All area fed from Sohar S/S	132kV Khabourah-Sohar ckt-1 autoreclosed. At 04:00hrs 132kV CB of TX-1 & TX-2 closed. 33kV I/C's of TX-1 & 2 normalised and all 33kV feeders were closed one by one between 04:01hrs and 04:09hrs. At 04:13hrs 33kV Capacitor bank No:1 & 2 closed and system back to normal.
76	30	North Batina & South Batina 05/08/05	1. 132/33kV Sohar S/S a)132kV Khabourah ckt-1 b)125MVA TX-1 & TX-2 c) 132kV Khabourah ckt-2 2. 132/33kV Khabourah S/S a) 125MVA TX-1 b) 132kV Bus Coupler c) 132kV Sohar ckt-2 3. Muladhah S/S: a) 132kV Khabourah ckt-1 b) 33kV Musanah-1 c) 33kV Rustaq 1 & 2 d) 33kV Billah-1	<u>Sohar S/S:</u> a) Distance relay, Zone-1, C-phase, location -5.6kM, ITS Relay, A/R lockout b) Master Trip Relay, DOC, E/F, BFR Relay c) Distance relay, Zone-1, C-phase, location - 25.15kM, ITS Relay flag <u>Khabourah S/S:</u> a) Trip Relay 1 & 2, O/C b) Trip Relay 1 & 2, O/C c) Trip Signal fuse VT SZ, Distance Relay: Fuse VTSZ, fault loc - no data <u>Muladhah S/S:</u> a) Distance Relay, Trip Signal TRO1 trip, Fuse VTSZ (SOTF appeared during trial charge) Cause: Under investigation Weather: High humidity (85%)	01:43 1.c)01:48 2.c)01:48	ARC ARC 02:04 02:05 03:44	All area fed from Sohar S/S and part of Musanah, Rustaq and Billah	At 01:48 hrs 132 kV Sohar- Khaburah ckt-2 tripped and auto reclosed at both ends. At 01:51 hrs Trial charging of Khaburah -1 at Mulladah SS was not successful. From 01:57hrs to 02:04 hrs Mulladah SS 33 kV feeders normalized. At 02:05 hrs 132 kV CBs of 125 MVA TX -1 & 2 closed at Sohar and all 33 kV feeders normalized. At 02:24 hrs 132 kV Bus coupler closed at Khaburah S/S. At 02:34 hrs 132 kV Sohar-1 closed at Khaburah S/S. At 03:07 hrs 132 kV Khaburah-1 closed at Mulladah S/S. At 03:44 hrs 125 MVA TX-1 normalized at Khaburah SS

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
77	31	North & South Batinah 06/08/05	1. 132/33 kV Sohar SS a) 132 kV Khaburah -1 2. 132/33 kV Khaburah SS a) 132 kV Mulladah -2 b) 132 kV Bus coupler c) 125 MVA TX -1 & 2 3. Mulladah SS a) 132 kV Khaburah -1 b) 125 MVA TX -1 & 2 4. Filayj SS 132 kV Filayj - Mulladah -2	Sohar: a) Dist.Zone -2 (C-N) & ARC lock out Khaburah : a) Distance relay b) O/C & Trip relay -1 &2 c) O/C & Trip relay -1 &2 Mulladah: a) Distance Relay b) O/C & Master trip -1 &2 Filayj : DOC & DEF Aided DEF start Cause : High humidity	4:48	06:11 05:55 &06:30 06:32 06:03	All area fed from Khaburah S/S & Mulladah S/S	05:55 hrs Khaburah 125 MVA TX -2 charged. 06:03 hrs Filayj SS 132 kV Mulladah -2 charged. 06:07 hrs Khaburah SS 33 kV feeders normalized. 06:11 hrs Sohar SS 132 kV Khaburah -1 closed. 06:16 hrs Khaburah SS 132 kV Bus coupler closed. 06:21 hrs Khaburah SS 132 kV Mulladah -1 closed. 06:30 hrs Khaburah SS 125 MVA TX -1 charged. 06:32 hrs Mulladah SS 125 MVA TX -1 & 2 charged. 06:56 hrs Mulladah SS 33 kV feeders normalized. 07:04 hrs 132 kV Mulladah khaburah ckts normalized.
78	32	North Batinah 06/08/05	132/33 kV Sohar SS 33 kV I/C of 125 MVA TX -2 to Bus -2 (2T0B)	O/C & Master trip Cause: while making Tx -1 & 2 as radial. 33 kV CB of TX -2 to Bus -1 opened first. Trip occurred while opening the 33 kV CB of TX -1 to Bus -2. This operation carried out while investigating the recent trips of grid transformers at the time of external faults.	16:02	16:05	All area fed from 33 kV Bus -2	16:05 hrs 33 kV CB closed and system normalized at 06:07 hrs
79	33	Dhahirah 08/08/05	132/33 kV Dank S/S 132kV Al Hail feeder	1st & 3rd Trip : Distance Relay, A,B, C phase, Main Protection, A/R initiated 2nd trip: Distance Relay, B phase, Main Protection, A/R initiated Cause: Weather was cloudy & windy in the afternoon. During 2nd & 3rd trip there was heavy rain in Dank and Yanqul area.	1) 13:40 2) 17:36 3) 18:23	ARC ARC ARC	Al Hail S/S and it's feeding area affected for 15 sec for each time.	Feeder was autoreclosed from Dank S/S each time and supply normalised. Live line washing will be arranged shortly. Also thorough patrolling will be done for finding any insulator problem.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
80	34	Dhahirah 09/08/05	1. 132/33 kV Al Wasit SS 132 kV Buraimi -1 132 kV Buraimi -2 2. 132/33 kV Buraimi SS 132 kV Al Wasit -2 15:46 & 15:56 hrs 132/33 kV Al wasit SS 132 kV Buraimi -2 3. 132/33 kV Buraimi SS 132 kV Al Wasit -2	Al Wasit : Ckt -1 Dist.(A,B,C) & Dir O/C Ckt -2 Dist. Zone -1(A,B,C) & ARC lock out. Buraimi : Ckt -2 Dist.Zone -1 (A,B,C) 15:46 hrs Dist Zone -1 (B,C) 15:56 hrs Dist Zone -1 (B,C) Cause : Wind, Sandstorm and light rain.	15:17 15:46 15:56	15:38 15:51 16:30	Entire Buraimi area from 15:17 to 15:38 hrs.	System normalized at 16:30 hrs
81	35	Sharquiya 11/08/05	1) 132/33/11kV Mudhairib S/S & 132kV Al Kamil S/S 132kV Al Kamil-Mudhairib line-1 2) 132/33/11kV Mudhairib S/S & 132kV Al Kamil S/S 132kV Al Kamil-Mudhairib line-2 (Same time GT-1A >-1B CB's tripped at Al Kamil P/S) 3)132/33/11kV Sur S/S 33kV Al Egga-1 33kV Al Egga-2 33kV Stadium 11kV Industrial Area 11kV Bilad Jina 11kV Barbuwera 4)132/33 kV JBB Ali S/S 33kV Al Ashkara 33kV JBB Ali-2 33kV JBB Ali-1	1) Distance Relay, Zone-1,C-phase 2a) Distance Relay, Zone-1,C-phase 3) U/F 4) U/F	1) 17:37 2) 17:46 3) 18:16 4) 18:16	19:59 20:08 18:54 18:44 18:45 19:57 19:57 18:35 18:33 18:34	Nil Nil (GT-1C survived disturbance and was carrying some load of Sur & JBB Ali S/S) Al Agga, Shama,Shiya,Ras l Had,Stadium,Al Flej,Sur Hospital, Industrial,Bilad Jinah, Barbuwera. Crusher,Wadi Sall,Ruwais,Rumaila,Al Ashkara, Jalan Bani Bo Ali	At 17:37 hrs 132kV Al Kamil-Mudhairib line-1 tripped from both ends. At 17:46 hrs 132kV Al Kamil-Mudhairib line-2 tripped from both ends and Grid separated at Al Kamil S/S. At 17:46 hrs GT-1A & GT-1B tripped at Al Kamil P/S. At 18:12 hrs 132kV Mudhairib line-1 closed from Al Kamil S/S. But line tripped when it closed from Mudhairib S/S. Same time under frequency activated and tripped many 33 & 11 kV feeders. At 19:56 & 19:57 hrs 132kV Mudharib line 1 & 2 closed from Al Kamil S/S respectively. At 19:59 hrs 132kV Al Kamil line-1 closed at Mudhairib S/S .While closing line GT-1C tripped at Al Kamil S/S (no units running in Al Kamil P/S. Feeding only through Al Kamil-Mudhairib line-1) At 20:08 hrs 132kV Al Kamil line-2 closed from Mudhairib S/S. At 20:52 hrs GT-1C synchronized. At 21:27 hrs GT-1B synchronized and system back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
82	36	Muscat 16/08/05	132/33/11kV Wadi Kabir S/S 33 kV incomer of 125 MVA TX-2 on Bus-1 and all 33kV feeders in Bus-1	Bus Bar Protection (Nothing abnormal found during investigation. Further analysis may be done in detail)	8:18	08:48 08:59 09:12 09:20 09:35 10:47	All feeders fed from Bus-1 affected. (Part of Wadi kabir, Ruwi, CBD, Riyam, Sldab areas)	Back feeding arranged to most of the areas (except Sidab and Work shop areas) between 08:48hrs to 09:35 . Checked the relays and meggered insulation and found nothing abnormal. At 10:42hrs 33kV I/C CB on Bus-1 closed. At 10:50hrs all 33kV feeders were closed one by one.
83	37	Dhakhliya 17/08/05	132kV Rusail P/S & 132/33kV Sumail S/S 132kV Rusail-Sumail line-1&2	Line-1: Rusail : Dist. Relay, Zone-1, (A-N), Loc - 6.21 km, Lockout relay Samail : Dist. Relay, Zone 1 (A,B,C), Loc - 23.3 km, ARC initiated. Line-2: Rusail : Dist. Relay, Zone-1 (B-N), Loc - 5.34 km & Lockout relay. Samail: Dist. Relay, Zone-1 (A,B,C) & ARC initiated. Cause: High humidity.	2:17	8:42	Nil	At 02:17hrs both circuits tripped and autoreclosed from Sumail S/S. Synchronisation from Rusail P/S and Samail SS was not successful. At 08:42 hrs lines were synchronized after changing the Synchro check Relay phase angle setting. Hand cleaning and line washing of feeder is in progress.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
84	38	North Batina & South Batina 21/08/05	<p>1)132/33 kV Khaburah S/S a) 125MVA TX-1 & TX-2 b) 132kV Bus Coupler</p> <p>2)132/33kV Sohar S/S 132kV Khaburah line-1 & 2</p> <p>3)132/33kV Muladhah S/S a) 132kV Khaburah line- 1 & 2 b) 33kV Musanah-1 c) 33kV Billah-1 d) 33kV Rustaq-2</p> <p>4)33/11kV Sur Al Baloosh Pri. S/S 10MVA TX-2</p> <p>5)33/11kV Liwa Pri. S/S 10MVA TX-1 & TX-2</p>	<p>1.a) O/C Relay & Trip relay 1.b) O/C Relay & Trip relay</p> <p>2) line-1: Distance Relay, Zone-3, (B,C-N) line-2: Distance Relay, Zone -3 , (C-N)</p> <p>3.a) Distance Relay, Zone-2, (C-N) b) Distance Relay, Zone-2 & 4, R,S,T phase c) O/C Relay, A & C phase d) Distance Relay,Zone-2,3 & 4, R,S,T phase A/R operated</p> <p>4) O/C ,R-phase</p> <p>5) O/C, R,Y,B phase</p> <p>Cause: 132kV feeders were tripped due to high humidity. Due to system fluctuation 33kV feeders tripped and load drop occurred.</p>	5:25	<p>06:13 06:16 06:22</p> <p>2) 06:04</p> <p>3.</p> <p>a) 06:36 b) 05:42 c) 05:42 d) ARC</p> <p>4) 05:42</p> <p>5) 06:08</p>	<p>1) All area fed from Khaburah S/S affected.</p> <p>3.b,c,d) Part of South Batina area</p> <p>4) & 5) Part of north Batina area</p>	<p>05:41hrs to 06:01hrs all 132 & 33 kV CB's opened at Khaburah S/S. 05:42 hrs 33 kV Fdrs at Mulladah and Buraimi S/S normalized. At 06:04 hrs 132 kV Khaburah-1 & 2 charged at Sohar S/S. At 06:13 hrs 132 kV Sohar Fdr-1 & 2 and Bus coupler closed at Khaburah S/S.</p> <p>At 06:16 hrs 125 MVA TX-1 & 2 charged at Khaburah S/S and 33 kV feeders load normalized by 06:22hrs.</p> <p>At 06:36 hrs 132 kV Khaburah Fdr-1 & 2 charged at Mulladah S/S. At 07:45 hrs 132 kV Mulladah Fdr-1 & 2 charged at Khaburah S/S.</p> <p>Note: Hotline washing of 132kV Sohar - Khaburah lines completed on 21/08/05. Line washing in progress for 132kV Khaburah-Muladhah lines.</p>
85		North Batina & South Batina 22/08/05	<p>132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah-Khaburah line-2</p>	<p>1st Trip <u>Muladhah SS</u> : Distance Relay, Fuse VTSZ & Autoreclosed <u>Khaburah SS</u> : Dist. Relay, Zone-1, L3-N, Loc-31.2 km & Autoreclosed.</p> <p>2nd Trip <u>Mulladah SS</u> : Dist. Relay , Zone-1 ,C-N,Loc-34km & Autoreclosed <u>Khaburah SS</u> : Dist.Relay, Zone-1, L3-N, Loc -36 km & Autoreclosed.</p> <p>Cause: Due to high humidity (85%)</p>	05:24 06:10	ARC ARC	Nil	Line-2 tripped from both sides at 05:24hrs & 06:10hrs. Both times line autoreclosed and system back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
86		North Batina & South Batina 23/08/05	132/33 kV Muladhah S/S & 132/33 kV Khaburah S/S 132kV Muladhah- Khaburah line-2	Muladhah SS: Distance Relay, Fuse VTSZ Khaburah SS : Distance Relay, Zone-1, L3 - N, Loc -22.3 km. Cause: Line tripped during live line washing at Tower-58	7:48	08:24 08:25	Nil	At 08:24hrs line closed at Muladhah S/S. At 08:25hrs line closed at Khaburah S/S Note: Stopped live line washing immediately after tripping. Collected water sample for conductivity testing. Continued live line washing after energising line.
	39	Rusail PS	Rusail PS GT - 5,6 &7	Gas pressure low	13:55	21:40	nil	13:55 hrs Gt - 5,6 &7 changed over to Distillate & OCC PS GT tripped. 14:03 hrs GT -6 tripped on high exhaust temperature. 14:07 hrs GT -7 changed back to Gas. Due less gas pressure generation restricted. To meet system demand Sharquiah Diesel used. 15:17 hrs GT -5 Shut down due to fuel leak. 19:30 hrs OGC repaired control valve. 21:09 hrs OCC PS GT Synchronized. 21:40 hrs GT -5 Synchronized. 29/08/05 16:16 hrs GT -6 declared available.
87	40	South Batinah 28/08/05	132/33KV Mulladah S/S a) 132KV & 33KV CB of 125MVA TX-2 b) 33KV Capacitor bank -1	132KV Side: Master trip relay 1 &2 , Auxiliary relay 1&2, ETR winding temperature relay 33KV side: Trip relay TC b) Trip relay Cause: Winding Alarm Indicator of Earthing transformer-2 fell down	9:56	10:38	All feeders fed from Bus-1	At 10:06 hrs manually opened all 33KV feeders on Bus -1. At 10:31 hrs 125MVA TX-2 charged after temporarily refixing the indicator. 10:36 hrs to 10:38 hrs all 33 kV feeders load normalized. At 10:39 hrs 33KV Capacitor Bank-1 CB closed and system back to normal. Note: In Muladha, each transformer is feeding only one bus (TX2 feeding Bus-1 and TX-1 feeding Bus-2) Hence, when TX-2 tripped, all load on 33 kV Bus-1 was affected.
88	41	Dhahirah 31/08/05	132/33/11KV Dank S/S 132KV Al-Hail Feeder	Distance Relay, A&C phase and A/R initiated Cause: Due to rain and wind at Al-Hail	15:02	ARC	Al Hail, Yanqul and Al Arid	Feeder auto reclosed and system back to normal
		September						

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
89	42	Dhahirah 02/09/05	132/33/11 kV Ibri Grid SS 1. 132/33 kV 63 MVA TX -1 2. 33 kV Capacitor Bank -1 & 2	1. Differential relay Sensitive E/F relay 2. E/F Cause: One single core blue phase cable out of two in 33 kV side of TX-1 punctured.	18:11	19:17 19:28 21:23	Part of Ibri, Dreez and Amla areas.	33 kV Bus coupler closed at 19:16 hrs. From 19:17 to 19:28 hrs 33 & 11 kV feeders load restored. After isolating the faulty cable TX-1 charged at 21:19 hrs. At 21:20 hrs 33 kV Bus coupler opened. 33 kV Capacitor Bank-1 & 2 charged at 21:23 hrs. Cable fault located on 03/09/05 and repair job in progress.
90	43	South Batinah 05/09/05	220 kV Barka & Filayj SS 220 kV Barka - Filayj ckt -2 220 kV Barka - Filayj ckt -1	Fdr -2 Barka SS: Distance Zone -1 (B-N), Current Differential relay and ARC lock out. Filayj SS: Current Differential relay (B phase), Distance protection and ARC lock out. Fdr -1 Barka SS: Distance Zone -1 (C-N), Current differential relay (C phase) and ARC lock out. Filayj SS: Distance protection (C-N), Current differential relay (C phase) and ARC lock out Cause: Foggy weather.	22:34 23:33 03:35 23:49 07:35	23:30 01:38 06/09/05 01:38 06/09/05 10:01 06/09/05	Feeders tripped on Under frequency. (Barka PS separated from rest of the system)	220 kV Barka - Filayj ckt -2 tripped at 22:34 hrs and normalized at 23:30 hrs. 220 kV Barka - Filayj ckt -2 tripped again at 23:33 hrs. This time Barka PS GT -2 also tripped. 220 kV Barka Filayj ckt -1 tripped at 23:49 hrs. Barka PS separated from rest of the system. GT -1 came to Island operation and ST tripped. System frequency dropped to 49.5 HZ and tripped the feeders connected with first stage under frequency. At 00:33 hrs on 06/09/05 all loads restored. 01:38 hrs 220 kV Barka - Filayj Fdr -1 & 2 normalized. At 03:35 hrs 220 kV Barka - Filayj Fdr -2 tripped again. At 07:35 hrs 220 kV Filayj - Barka Fdr -1 manually opened to clean the insulators at Barka SS Gantry. After cleaning the insulators os Barka SS gantry 220 kV Feeders 1 & 2 charged.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
--do--	--do--	Muscat (05/09/05)	220 kV Filayj & MSQ SS 220 kV Filayj - MSQ Fdr -1 & 2	Fdr -1 Filayj SS : Distance Zone -1 (A -N), Current differential relay (A -phase) and ARC lock out. MSQ SS : Distance Zone -1 (A -N), Current differential relay (A -phase) and ARC lock out. Fdr -2 Filayj SS : Distance Protection MSQ SS : E/F relay Alarm, ARC relay Alarm & Trip relay Cause : High humidity.	6:17	7:53	Nil	Both feeders were normalized at 07:53 hrs.
--do--	--do--	South Batinah 06/09/05	220 kV Filayj & Barka SS 220 kV Filayj - Barka Fdr -1	Barka : Distance Zone -1 (C-N), Current differential relay and ARC lock out. Filayj : Distance Zone -2 (C-N) and Current differential relay. Cause : Foggy weather.	23:35	00:28 07/09/05	Nil	Feeder normalized at 00:28 hrs.
--do--	--do--	South Batina 07/09/05	220 kV Filayj & Barka SS 220 kV Filayj - Barka Circuit-1	Barka SS : Current differential, DEF- I Distance, Phase-C, zone-1 (280 mtrs), ARC lockout Filayj SS : Current differential, DEF- I, Distance, Phase-C, zone-2 (10km) Cause : Thick fog and and high humidity caused excessive corona & sparking on the insulators.(Humidity more than 85%)	23:35 (06/09/05) 00:31 04:41	00:28 00:54 11:59	Nil	At 23:35hrs circuit-1 tripped and closed at 00:28hrs. At 00:31hrs circuit-1 tripped again. At 00:54 hrs circuit-1 closed from Filayj SS without load and holding ok. Circuit-1 tripped again at 04:41 hrs. Isolated line from both sides and arranged hand cleaning. Line charged at 11:59hrs.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
--do--	--do--	South Batina 07/09/05	1) 220 kV Filayj & Barka SS: 220 kV Filayj - Barka Circuit- 2 2) Barka PS: GT-1,GT-2 & ST	<u>Barka SS</u> : Current differential, DEF-I, Distance, Phase-C, zone-1 (280 mtrs), ARC lockout <u>Filayj SS</u> : Current differential, DEF- I, Distance, Phase-C, zone-2 (10km) Cause: Due to thick fog and high humidity. Note: Hand cleaning of 220kV Barka - Filayj ckt-1 & 2 were carried out completely on 7th & 8th	01:00 04:57	01:16 05:10 08:45 09:56 11:09	Nil (No consumer affected. Only Barka PS affected)	01:00 hrs 220 kV Barka - Filayj ckt-2 tripped at both ends and Barka PS separated from rest of the system and all running machines tripped (GT -1,2 & ST) 01:16 hrs both ends of 220 kV Barka- Filayj ckt-2 charged and given clearance to Barka PS to start machines. 04:11 & 04:33hrs GT-1 and GT-2 synchronized at Barka PS 04:57 hrs 220 kV Barka - Filayj ckt -2 tripped again at both ends. Barka PS separated from system again and GT-1 & 2 tripped. At 05:10 hrs 220 kV Barka - Filayj fdr-2 normalized. At 08:45 hrs GT-1 synchronized. At 09:56 hrs GT-2 Synchronized. At 11:09 hrs Barka PS ST synchronized.
--do--	--do--	South Batina & Muscat 07/09/05	220/132 kV Filayj SS & 220/132/33 kV MSQ SS 220 kV Filayj - MSQ Circuit-2	<u>MSQ SS</u> : Current differential relay-2, Distance, Phase-A, zone-1 <u>Filayj SS</u> : Current differential, DEF- I, Distance, DEF-II, zone-1, A-ph (22.8 km) DOC, DEF-III Cause: Due to high humidity and fog	4:28	05:09 06:45	Nil	At 05:09 hrs circuit closed from Filayj SS. At 06:45hrs closed at MSQ SS and system back to normal.
--do--	--do--	Dhakhleya & Muscat 07/09/05	132/33kV Samail SS & Rusail PS 132kV Rusail-Samail ckt-1	<u>Rusail</u> : Distance C-ph, ARC initiaed <u>Sumail</u> : Distance Zone-2, C-N, 33 km Cause: Due to high humidity and fog	6:01	ARC	Nil	Line autoreclosed from Samail SS. Rusail end kept open due to SF6 gas pressure low alarm. 07:56 hrs 132 kV Sumail-1 closed at Rusail PS after filling SF6 gas.
--do--	--do--	North Batina 07/09/05	1) 132/33kV Khaburah SS a)132/33kV ,125MVA TX-1 & TX- 2 b) 132kV Bus coupler c) 132kV Muladhah -2 2) 132/33kV Sohar S/S 132 kV Khaburah ckt-1	1.a) O/C & trip relay b) O/C c) Distance Relay 2.Distance Relay, Zone-1 C-phase, inter trip send Cause: Due to high humidity and fog	2:44	03:00 03:19 03:30	All area fed from Khaburah SS affected (Khaburah, Bidaya, Dil Abdul Salam, Wadi Bani Omer)	132kV Muladhah-2 tripped and autoreclosed from Khaburah. At 03:00 hrs 132kV Khaburah- 1 charged at Sohar SS. At 03:01 hrs 132 kV Bus coupler closed. At 03:19 hrs 132 & 33 kV CBs of 125 MVA TX-1 & 2 charged at Khaburah SS. From 03:20 to 03:30hrs all 33 kV feeders normalized at Khaburah SS

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
--do--	--do--	North Batina 07/09/05	1) 132/33kV Khaburah SS a) 132/33kV ,125MVA TX-1 & TX-2 b) 132kV Bus coupler c) 132kV Muladhah -2 2) 132/33kV Sohar S/S 132 kV Khaburah ckt-1 3) 132/33kV Muladhah S/S 132 kV Khaburah ckt-1	1.a) O/C & trip relay b) O/C c) Distance Relay 2.b) Distance Relay, Zone-1 C-phase, inter trip send 3) Distance Relay Cause: Due to high humidity and fog	5:28	06:06 06:18 06:28 06:30	All area fed from Khaburah SS affected. (Khaburah, Bidaya, Dil Abdul Salam, Wadi Bani Omer)	At 06:06 hrs 132 kV CB of Bus coupler charged at Khaburah SS. At 06:10 to 06:15 hrs 132 & 33 kV CBs of 125 MVA TX -1 & 2 charged. At 06:18 hrs all 33 kV feedrs normalized at Khaburah SS. At 06:28 hrs 132 kV Mulladah-2 charged at Khaburah SS. At 06:30 hrs 132 kV Khaburah-1 charged at Mulladah SS
91		North Batinah 12/09/05	132/33 KV Sohar & Khabourah Substations 132KV Sohar-Khabourah Feeder -2	<u>Sohar S/S</u> Distance Relay Zone-1(C-N) <u>Khabourah S/S</u> Distance Relay Cause: High humidity	5:52	ARC	NIL	Feeder autoreclosed
92	44	North Batinah 14/09/05	1) Wadi Jizzi PS 132KV Shinas Ckt 2) 132/33KV Shinas S/S 33KV Shinas Feeder-1	<u>Sohar S/S</u> : Distance Relay , C-phase & ITS Relay, ARC initiated <u>Shinas S/S</u> : Distance Relay, Zone-1, SOTF & ARC lockout Cause: Heavy Fog & High Humidity (At Shinas humidity 85%)	04:45 05:58	ARC 04:57 ARC 06:47	1) All areas fed from Shinas S/S 2) Part of Aswadh, Murrah Aswdh, Jabal Aqo, Maldha, Jefar Majid, Shabiya & ROP	132kV Shinas feeder tripped at 04:45hrs & 05:58hrs and autoreclosed both the time. 33kV Shinas fdr-1 manually closed.
--do--	--do--	North Batinah & South Batina 14/09/05	1) 132/33 kV Sohar S/S 132KV Khabourah ckt-1 2) 132/33 kV Khabourah S/S 125 MVA TX-1 3) 132/33 kV Muladah S/S 132KV Khabourah ckt-1	<u>Sohar S/S</u> Distance Relay, Zone-1,C-phase , Fault loc: 41.77Km , ARC initiated <u>Khabourah S/S</u> 132KV side: Trip Relay-1 &2, O/C, R-phase 33KV side: Master trip <u>Muladah S/S</u> Distance Relay ,Zone-2, ARC inhibit Cause: High humidity at North Batina area	5:41	1) ARC 2) 06:03 3) 05:58	Nil	132KV Khaburah line-1 autoreclosed at Sohar S/S. At 05:58hrs 132KV Khaburah line -1 closed at Muladhah S/S. At 06:03hrs 125MVA TX-1 energised at Khaburah S/S and system back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
--do--	--do--	North Batinah 14/09/05	132/33 kV Sohar S/S 1) 33KV I/C's of 125 MVA TX-1 & TX-2 on Bus-2 2) All 33kV Feeder CB's on Bus-2 Note: 33kV Sohar Hospital fdr-1 also tripped same time. This Feeder tripped two times before, at 22:27hrs on 13/09/05 & 04:42hrs respectively.	Bus Section Panel : Frame earth leakage protection acted [Main Zone and check Zone 33KV BusBar protection Trip Relay] Cause: Under investigation	6:05	06:23 06:26 08:14	All feeders fed from Bus-2 affected. (Part of Sohar Town, Part of Sohar industrial area, Sohar port area, Uwayanat, Wadi Hibi, Part of Sham, Al Huwail).	At 06:05 hrs all CB's tripped on Bus-2 and caused supply failure occurred. At 06:23hrs I/C CB's were closed and normalized all 33KV feeders one by one at 06:26 hrs. 33KV Sohar Hospital Feeder-1 closed at 08:14hrs and system back to normal.
93	45	Muscat 17/09/05	Ghubrah PS & MSQ SS 132KV Ghubrah - MSQ ckt - 2	Ghubrah PS Distance Relay ,Zone-1 (Y-N) MSQ SS Distance protection aided trip and autorecloser initiated Cause: High humidity (84 %)	5:11	8:17	NIL	Feeder autoreclosed at MSQ SS and at 08:17 hrs normalized at Ghubrah PS.
94		North Batina 17/09/05	Sohar SS & Khabourah SS 132KV Sohar-Khabourah ckt-2	Sohar SS Distance Relay ,Zone-1 (C-N) Khabourah SS Distance Relay (C-N) Fault location: 55.4 km Cause: High humidity (89 %)	6:22	ARC	NIL	Autoreclosed.
95		Sharquiah 18/09/05	132/33/11 kV Izki & Mudhaibi Grid SS 132 kV Izki - Mudhaibi Feeder -1	Distance Zone -1 (A-N) (both ends) Cause: High humidity.	5:30	ARC	Nil	Autoreclosed.
96	46	Muscat 19/09/05	132/33/11kV Wadi Adai S/S 132kV Wadi Kabir line-1	<u>Wadi Adai S/S:</u> Distance Relay,Zone-1 ,Y-N, <u>Wadi Kabir SS :</u> PLC -1 Inter trip received Cause: Y-phase cable failed	14:51		Nil	

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
97	47	Muscat 20/09/05	1) Ghubrah PS & 132/33kV Bousher SS 132kV Ghubrah-Bausher ckt-2	Bousher SS : Dist. Relay, Zone -1 (A,B,C-N) & ARC lock out Ghubrah PS : Dist. Relay, Zone -1 (A -N) Cause: High humidity (85%)	00:05	17:07	Nil	At 01:56hrs feeder closed at Bausher SS. But line opened again on finding arcing at Ghubrah Gantry. Feeder normalized at 17:07 hrs after hand cleaning of insulators.
--do--	--do--	Muscat 20/09/05	Ghubrah PS & 132/33kV MSQ S/S 132 kV Ghubrah- MSQ ckt-1 (Boiler -2,3,4 & 6 tripped and ST-2,3 & 4 emergency shutdown at Ghubrah P/S)	MSQ SS : Distance Zone -1 (A-N) & autoreclosed. Ghubrah PS : Inter trip received Cause: High humidity	00:05	ARC 00:58	Some areas in Muscat region affected due to 33& 11kV fdr tripping	Autoreclosed at MSQ SS and manually closed at Ghubrah PS.
--do--	--do--	Muscat 20/09/05	Ghubrah PS & 132/33kV Bousher SS 1)132kV Ghubrah-Bausher line-1 (WHRB -1 & 2 tripped at Ghubrah PS)	Bousher SS : Dist. Relay, Zone -2 (A,B,C-N) & ARC lockout Ghubrah PS : Dist. Relay Cause: High humidity	0:27	2:32	Nil	Feeder normalized at 02:32 hrs.
--do--	--do--	Muscat 20/09/05	Rusail PS 132/33kV Bousher SS 132 kV Rusail - Bousher ckt-2	Rusail PS : Dist. Relay, Zone -1 (B-N) Bousher SS : Dist. Relay, Zone -1 (B-N) & Autoreclosed. Cause : High humidity	1:01	1:48	Entire areas feeding from Bousher SS affected.	01:08 hrs all 33 kV feeders manually opened. 01:41 hrs 132 kV Rusail- Bousher ckt- 2 normalized. 01:48 hrs all 33 kV feeders normalized.
--do--	--do--	Muscat 20/09/05	132/33kV MSQ SS & 132/33kV Wadi Adai SS a)132 kV MSQ- Wadi Adai ckt-2 b)132 kV MSQ- Wadi Adai ckt-1	a) Wadi Adai SS : Dist. Relay, Zone -1 (A-N) MSQ SS : Dist. Relay Relay, Inter trip received & Autoreclosed. b) Wadi Adai SS : Dist. Relay, zone-1 (A-N) & Autoreclosed MSQ SS : Dist. Relay Relay (A-N), Inter trip received & Autoreclosed Cause : High humidity	01:31 01:37	02:05 ARC	Some areas in Muscat region affected due to 33& 11kV fdr tripping	02:05 hrs Circuit-2 closed. Circuit -1 tripped and autoreclosed at 01:37 hrs.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
--do--	--do--	Muscat 20/09/05	132/33kV MSQ S/S & 132/33kV Jahloot SS 132kV Jahloot line-2 and 125MVA TX-2	MSQ SS : Distance Zone-2 & ARC lockout. Jahloot SS : O/C & E/F Cause: High humidity	02:16	02:52	Nil	At 02:44 hrs Jahloot line-2 closed from MSQ S/S. At 02:45hrs TX-2 energised at Jahloot S/S and system back to normal.
--do--	--do--	Muscat 20/09/05	132/33kV MSQ SS & 132/33kV Wadi Adai SS 132 kV MSQ- Wadi Adai ckt-1	Wadi Adai SS : Distance Zone- 1 (A-N), MSQ SS : Distance relay, Inter trip received & Autoreclosed Cause: High humidity (85%)	2:34	ARC 02:40	Some areas in Muscat region affected due to 11kV fdr tripping	Feeder auto reclosed from MSQ S/S and manually closed at Wadi Adai S/S
98		Sharquiyah 20/09/05	132kV Al Kamil S/S 132kV Sur line-1 132/33/11kV Sur S/S 125MVA TX-1	Al Kamil S/S: Distance Relay, Zone-2 , Y-phase. Sur S/S: Main protection Cause : High humidity	19:26	20:02	Nil	19:52 hrs 132kV Sur line -1 energised. 20:02 hrs 125MVA TX-1 energised.
99		Muscat 24/09/05	Ghubrah PS 132 kV Ghubrah MSQ ckt -2	Ghubrah : PLC fail (Inter trip receive) MSQ : not tripped Cause : 48 V Battery charger failure at MSQ SS.	20:26	16:15 25/09/05	Nil	Tripping occurred due to 48 V battery charger failure at MSQ. 20:51 hrs feeder manually opened at MSQ SS. It will be normalized after repairing the battery charger problem.
100		Sharquiah 27/09/05	132 kV Al Kamil S/S 132 kV Al Kamil-Sur Ckt - 2 132/33/11kV Sur S/S 125 MVA TX -2	<u>Al Kamil S/S:</u> Distance Relay,Zone -1(B -N) <u>Sur S/S:</u> Trip Relay -1 &2 Cause: High humidity.	22:17	ARC 22:36	Nil	Feeder autoreclosed at Al Kamil end and Manually closed at Sur end. Note: Live line washing of circuit 1& 2 in progress.
101		Sharquiah 29/09/05	132 kV Al Kamil S/S 132 kV Al Kamil-Sur Ckt - 1 132/33/11kV Sur S/S 125 MVA TX -1	<u>Al Kamil S/S:</u> Distance Relay,Zone -1(B -N) Location-62 km. <u>Sur S/S:</u> NIL Cause: High humidity.	4:48	ARC 05:06	Nil	Feeder autoreclosed at Al Kamil end and Manually closed at Sur end. Note: Live line washing of circuit 1& 2 in progress.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
102		Sharquiah 29/09/05	132 kV Al Kamil S/S 132 kV Al Kamil-JBB-Ali Ckt - 2 132/33/11kV JBB-Ali S/S 125 MVA TX -2	Al Kamil S/S: Distance Relay, Zone -2(A -N) Location-63.9 km Sur S/S: Trip Relay -1 &2 Cause: High humidity.	7:10	ARC 07:26	Nil	Feeder autoreclosed at Al Kamil end and Manually closed at Sur end. Note: Live line washing of gantry and first tower at JBB-Ali S/S
		October						
103	48	Dhahirah 06/10/05	132/33 kV Ibra S/S 1. 63MVA TX-1 2. 33kV Cap. Bank- 1 &2	1) 132kV side: Differential Protection & Trip Relay 33kV side: no indication 2. Over voltage Cause : Main Transformer's 33 kV cable termination failure which is connecting to Earthing TX.	11:55	12:27 10:09 (07/10/05)	Part of Ibra area, MOD,Dreez,Wali office	At 11:55hrs 63MVA TX-1 tripped along with 33kV Capacitor Bank - 1 &2. At 12:24 hrs 33kV Bus Coupler closed. At 12:27 hrs all 33kV feeders were closed and supply normalized. 07/10/05: At 10:05hrs 132kV CB of TX-1 energised after replacing the cable termination. At 10:09 hrs 33kV CB of TX-1 closed and opened 33kV Bus section. At 10:12 hrs 33kV Capacitor bank no:1 & 2 closed.
104		Muscat 08/10/05	220/132/33/11kV MSQ S/S 48V Battery Charger & Communication system failed due to MCB trip Ghubrah PS: 132kV MSQ line-2 (Tripped only at Ghubrah PS side)	1. Charger failed 2. PLC fail & inter trip received Cause: 48V Battery charger tripped and it caused loss of DC supply to communication system	09:35 09:53	11:22	Only communication to Muscat substations affected	At 09:35hrs Battery charger MCB tripped and communication to MSQ,Wadi Adai,Wadi Kabir,Al Falaj & Jahloot S/S were affected. At 09:53hrs 132kV MSQ line-2 tripped. At 10:45hrs MCB closed and communication re-established. At 11:22hrs MSQ line-2 closed and system back to normal.
105		North Batina 09/10/05	132/33kV Al Wasit S/S & Wadi Jizzi PS 1. 132 kV Wadi Jizzi- Al Wasit ckt-2 2. GT-11 tripped at Wadi Jizzi PS	Wadi Jizzi : Distance Relay, Zone -1 (A-N) Al Wasit S/S: Distance relay Zone-2,Aided trip. GT -11 at Wadi Jizzi PS tripped on Differential protection. Cause : Due to Live line washing at Wadi Jizzi PS gantry.	9:14	9:58	Nil	At 09:58 hrs 132 kV Wadi Jizzi - Al Wasit ckt -2 normalized after line washing. At 12:00 hrs Wadi Jizzi GT-11 declared available.
106		North Batina 09/10/05	132/33kV Sohar S/S & Wadi Jizzi PS 132 kV Wadi Jizzi- Sohar ckt-1	Wadi Jizzi : Distance Relay, Zone-1 (C-N) Sohar S/S : Distance relay, Zone-2, aided trip Cause : Due to Live line washing at Wadi Jizzi PS gantry.	10:28	11:25	Nil	At 11:25 hrs 132 kV Wadi Jizzi - Al Wasit ckt 1 normalized after line washing.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
107		Muscat 10/10/05	220/132/33/11kV MSQ S/S 48V Battery Charger & Communication system failed due to MCB trip Ghubrah PS: 132kV MSQ line-2 (Tripped only at Ghubrah PS side)	1. Charger failed 2. PLC fail & inter trip received Cause: 48V Battery charger tripped and it caused loss of DC supply to communication system	01:29 01:32	02:08 02:14	Only communication to Muscat substations affected	At 01:29hrs Battery charger MCB tripped and communication to MSQ,Wadi Adai,Wadi Kabir,Al Falaj & Jahloot S/S were affected. At 01:32hrs 132kV MSQ line-2 tripped. At 02:08hrs MCB closed and communication re-established. At 02:14hrs MSQ line-2 closed and system back to normal.
108		Muscat 13/10/05	220/132/33/11kV MSQ S/S & 132/33kV Jahloot S/S 132k MSQ - Jahloot -1 125MVA TX-1	MSQ S/S: Main Protection, Dist. Relay, Zone-1, ARC lockout. Jahloot S/S: O/C ,R&B phase Cause: Due to high humidity	1:31	8:44	Nil	At 02:08 hrs 132kV Jahloot ckt-1 closed from MSQ S/S without load. At 02:09 hrs 132kV Jahloot circuit-1 manually opened. At 08:43 hrs 132kV Jahloot circuit-1 closed from MSQ S/S. At 08:44 hrs 132kV CB of TX-1 closed at Jahloot S/S. At 08:54 hrs 33kV I/C CB's of TX-1 closed System back to normal.
109		Sharquiya 15/10/05	132kV Al Kamil S/S & 132/33/11kV Sur S/S 1) 132 kV Al Kamil - Sur Feeder- 1 2) 132 kV Al Kamil - Sur Feeder- 2	1) Al Kamil S/S: Distance Relay, Zone-1, R- phase, Fault Location - 42.30 km , A/R initiated. Sur S/S: Trip Relay 1& 2 2) Al Kamil S/S: Distance Relay, Zone-1,R- phase, Fault location - 40.42 km, A/R initiated Sur S/S: Trip Relay 1& 2	23:38 01:53 (16/10/05)	23:44 01:58 (16/10/05)	Nil	At 23:38 hrs Al Kamil - Sur ckt-1 tripped from both ends and auto reclosed at Al- Kamil end. At 23:44hrs TX-1 normalized at Sur S/S. At 01:53 hrs on 16/10/05 Al Kamil-Sur ckt-2 tripped from both sides and auto reclosed at Al Kamil end. At 01:58 hrs TX-2 normalized at Sur S/S.
110		South Batina 20/10/05	132/33kV Muladha h S/S & 132/33kV Khaburah S/S 132kV Muldah-Khaburah line-1	22:03 hrs Muladah S/S: Distance Relay, Zone-1, [Y- N] Fault Location – 33.9 km, A/R initiated Khabourah S/S: Distance Relay, Zone-1, [Y- N] Fault Location – 37.1 km, A/R initiated 23:21 hrs Muladah S/S: Distance Relay, Zone-1, [B- N] Fault Location – 33.0 km, A/R initiated Khabourah S/S: Distance Relay, Zone-1, [B- N] Fault Location – 36.6 km, A/R initiated	22:03 23:21	ARC ARC	Nil	Line autoreclosed both times and system normalised.
111		Dhakhliya 23/10/05	132kV Rusail PS & 132/33kV Suamil S/S 132kV Rusail-Samail line-1	Rusail PS: Distance Relay, Zone-1, [B-N] Fault Location – 3.289 km. Samail S/S: Teleprotection Relay Fault Location – 33.95 km Cause: Due to hot line washing	9:46	10:19 10:27	Nil	At 09:46 hrs 132KV Rusail- Samail Line-1 tripped from both ends.At 10:19 hrs 132KV Rusail Line No.1 closed from Samail S/S.At 10:27 hrs 132KV Samail Line No.1 closed from Rusail PS.System back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
112	49	Muscat 23/10/05	132/33kV Rusail PS 1) 132/33 kV 75MVA IBTX-3 2) 132/33 kV 75MVA IBTX-4	1. O/C & Neutral E/F(51N) 2. O/C & Neutral E/F(51N) Cause: 33kV cable of Industrial fdr-4 failed. Rusail PS IBTX-3 feeding to 33kV Bus-1 B-section & IBTX-4 feeding to Bus-2 B-section	1) 00:58 2) 01:57	03:09 03:11	Sultan Qaboos university, Rusail Industrial area, Industrial Housing (At 00:58hrs Bus-1 Section B supply affected & at 01:57hrs Bus-2 Section B supply affected.)	At 01:20hrs all 33kV feeders were shifted to Bus-2 Section - B and closed feeders one by one. But while closing 33kV Industrial fdr-4, IBTX-4 tripped and supply lost in Bus-2 Section -B. 03:09hrs 33kV CB of IBTX-3 closed and energised Bus-1 section -B. At 03:10hrs all 33kV feeders were closed except Industriail fdr-4. At 03:11hrs 33kV CB of IBTX-4 closed.
113		Dakhilya 24/10/05	132/33 kV Samail & Izki Grid SS 132 kV Samail - Izki ckt - 2	Samail: Dist Zone -1(B-N) Fault loc.- 11.38 km, ARC lock out Izki: Dist Zone -3 Fault loc - 14.06 km Cause: Under investigation Live line washing was being done during this time in Rusail - Samail feeders	8:30	9:15	Nil	Both ends of the feeder tripped, autoreclosed and again tripped. At 09:15 hrs both ends closed one by one.
114		Sharquiya 26/10/05	132/33 kV Al Kamil S/S 132/33/11kV JBB Ali S/S 132 kV Al Kamil-JBB Ali ckt - 1	Al Kamil: Dist. Relay, Zone -1, A-phase, Fault loc.- 45.5 km, ARC initiated. JBB Ali : Trip Relay 1&2 Cause: Due to high humidity	0:06	ARC 01:02	Nil	00:06 hrs Al Kamil - JBB Ali ckt-1 tripped from both ends and auto reclosed at Al-Kamil end.01:02 hrs TX-1 normalized at JBB Ali S/Ssystem back to normal.
115		Dhakhliya 26/10/05	132kV Rusail PS & 132/33 kV Samail S/S 132kV Rusail-Samail Ckt-2	Rusail PS: Distance Relay, Zone-1, C-N, Fault location: 6.494 km, ARC lockout Samail S/S: Distance Relay, Zone-1, C-phase, Fault location- 24.33km Cause: Due to live line washing on Tower-147	9:14	9:28	Nil	At 09:27 hrs 132kV Rusail line-2 closed from Samail S/S. At 09:28 hrs 132kV Samail line-2 closed from Rusail P/S. System back to normal.
116		Sharquiya 27/10/05	132kV Al Kamil S/S & 132/33/11 kV Sur S/S 132kV Al Kamil-Sur ckt-1	Al-Kamil: Distance Relay, Zone-1, A-phase, Fault location: 40.46 km, ARC Initiated Sur S/S: Trip Relay 1 & 2 Cause: Due to high humidity	0:39	0:49	Nil	Line tripped from both sides and auto reclosed at Al-Kamil end. At 00:49 hrs TX-1 normalized at Sur S/S. System back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
117		Sharquiya 31/10/05	132kV Al Kamil S/S & 132/33/11kV Sur S/S 132kV Al Kamil-Sur ckt-1	<u>Al-Kamil</u> : Distance Relay, Zone-1, A-phase, Fault location -31.8 km, ARC Initiated <u>Sur S/S</u> : Trip Relay 1 & 2 Cause : High humidity	5:32	ARC 05:54	Nil	At 05:32 hrs Al Kamil- Sur ckt-1 tripped from both ends and auto reclosed at Al Kamil end. At 05:54 hrs TX-1 normalized at Sur SS.
		November						
118		South Batina 02/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah-Khaburah line-1	<u>Muladhah S/S</u> : Diat. Relay, Zone-1,(C-N), Fault loc- 33.6km, A/R initiated <u>Khaburah S/S</u> : Dist. Relay, Zone-1,(C-N), Fault loc- 36.7km, A/R initiated	5:08	ARC	Nil	Line autoreclosed from both sides and sytem normalised.
119		Dhakliya & Dahirah 04/11/05	132/33/11kV Nizwa S/S & 132/33/11kV Ibri S/S 132kV Nizwa-Ibri line-1	<u>Nizwa S/S</u> : Distance Relay, Zone-1, A, B, C phase, Main protection, Fault location- 48.5 km, A/R Lockout <u>Ibri S/S</u> : Distance Relay, Zone-1, C- phase, Fault Location -108.3.7 km, A/R Lockout.	6:02	7:33	Nil	At 06:02 hrs 132 kV Nizwa-Ibri line-1 tripped from both sides. At 06:39 hrs Ibri line-1 closed at Nizwa S/S. At 07:33 hrs Nizwa line-1 closed at Ibri S/S. System back to normal.
120		Sharquiah 07/11/05	132/33/11 kV Mudaibi and Mudairib Grid SS 132 kV Mudaibi - Mudarib ckt -1	Both ends Distance Zone -1 (A-N) ARC initiated.	23:38	ARC	Nil	Feeder tripped and autoreclosed at both ends.
121		Batinah 08/11/05	132/33 kV Mulladah and Khaburah Grid SS 132 kV Mulladah - Khaburah ckt -2	Both ends Distance Zone -1 (A-N) ARC initiated.	0:18	ARC	Nil	Feeder tripped and autoreclosed at both ends.
122		Sharquia 08/11/05	132/33 kV Mudaibi and Izki Grid SS 132 kV Mudaibi - Izki ckt -2	Both ends Distance Zone -1 (C-N) ARC initiated.	1:23	ARC	Nil	Feeder tripped and autoreclosed at both ends.
123		Sharquia 10/11/05	132kV Al Kamil S/S & 132/33/11kV Sur S/S 132kV Al Kamil-Sur ckt-2	<u>Al Kamil S/S</u> : Distance relay, Zone-1, A- phase, Fault Location: 31.95 km, A/R operated. <u>Sur S/S</u> : Trip Relay 1 & 2	1:18	1:30	Nil	At 01:18 hrs Al Kamil- Sur ckt-2 tripped from both ends and auto reclosed at Al Kamil end. At 01:30 hrs TX-2 normalized at Sur SS.
124		South Batina 10/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah-Khaburah line-1	<u>Muldhah S/S</u> : Distance relay, Zone-1, R-N, Location: 40.9 km, A/R operated. <u>Khaburah S/S</u> : Distance Relay, Zone-1, R- N, Location-30.3km Cause : Transient fault	4:28	1:30	Nil	Line tripped from both sides and auto reclosed. System back to normal..

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
125		South Batina 10/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah -Khaburah line - 1	At 20:49hrs Muldhah S/S: Dist. relay, Zone-1,C-N, Location:32.9 km, Khaburah S/S: Dist. Relay, Zone-1, C-N, Location-36.7km At 21:38hrs Muldhah S/S: Dist. relay,Zone-1,C-N, Location:30.8 km Khaburah S/S: Dist.relay, Zone-1, C-N, Location-38.7km Cause: Transient fault	20:49 21:38	ARC ARC	Nil	Line tripped at 04:28hrs, 20:49hrs & 21:38hrs and auto reclosed from both sides all the times. System back to normal..
126		South Batina 12/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah -Khaburah line - 1	Muladhah S/S: Dist. relay,Zone-1,C-N, Location: 37.2 km Khaburah S/S: Dist.relay, Zone-1, C-N, Location: 33 km Cause: Transient fault	20:48	ARC	Nil	Line tripped at 20:48hrs and auto reclosed from both sides. System back to normal.
127		South Batina 14/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah -Khaburah line - 2	Muladhah S/S: Dist. relay,Zone-1,A-N, Location: 34.4 km Khaburah S/S: Dist.relay, Zone-1, A-N, Location: 36.3 km Cause: Transient fault	1:46	ARC	Nil	Line tripped at 01:46hrs and auto reclosed from both sides. System back to normal.
128		Sharqiya 16/11/05	132/33kV Mudharib S/S & 132/33kV Mudhaibi S/S 132kV Mudharib -Mudhaibi line - 1	MudharibS/S: Dist. relay,Zone-1,A-N, Location: 50.54 km Mudhaibi S/S: Dist.relay, Zone-1, A-N, Location: 18.64 km Cause: Transient fault	2:28	ARC	Nil	Line tripped at 02:28hrs and auto reclosed from both sides. System back to normal.
129		South Batinah 17/11/05	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132KV Muladhah -Khabourah Ckt-1	Muladah SS: Distance Relay, Zone-1,(C-N) phase, Fault location- 31.5 Km Khabourah SS: Distance -Relay, Zone-1,(C- N) phase, Fault location- 37.9Km Cause: Transient Fault Weather: Drizzling at Muladah area	22:07	ARC	NIL	Feeder autoreclosed from both ends

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
130	50	Muscat 20/11/05	132/33KV Jahloot SS 132KV & 33KV CB's of 125MVA TX-1 & TX-2	132KV side: Inter trip received 33KV side: Trip relay Cause : Defect in fire fighting System initiated trip of transformers and which is under further investigation	12:35	13:02	All feeding areas from Jahloot SS	13:00 hrs TX -1 normalized. 13:02 hrs 33 kV feeders restored. 13:04 hrs TX -2 normalized.
131		Sharquiya 22/11/05	132kV Al Kamil S/S & 132/33/11kV JBB Ali S/S 132kV Al Kamil-JBB Ali circuit -1	Al Kamil S/S: Dist. relay,Zone-2, B-phase, Location: 58.03 km,ARC lockout JBB Ali S/S: Master Trip Relay Cause: Transient Fault Weather : High humidity at Al Kamil side (Humidity - 82%, Temperature - 21 C)	1:00	1:34	Nil	At 01:16hrs 132kV JBB Ali line-1 closed from Al Kamil S/S.At 01:19hrs 132kV CB of 125MVA TX-1 closed at JBB Ali S/S. At 01:20hrs 33kV I/C CB 1TOA closed. At 01:21hrs 33kV I/C CB 1TOB closed. System back to normal
132		Sharquiya	132kV Al Kamil S/S & 132/33/11kV Mudairib S/S 132kV Al Kamil- Mudairib line-2	Al Kamil S/S: Dist.relay, Zone-1, A-phase, Location: 22.74km, Autoreclosed Mudairib S/S: Dist.relay,Zone-1, A-phase, Location: 36.4km, Autoreclosed Cause: Transient Fault Weather : Humidity - 72%, Temp. - 22 C	2:00	ARC	Nil	02:00hrs 132kV Al Kamil- Mudairib line-2 tripped from both sides and autoreclosed.System back to normal
	51	South Batinah 24/11/05	Barka PS ST Tripped	Exhaust Pressure high. Cause: This occurred due to reduction in MP pressure due to MP pressure Control valve closure.	15:09	16:04	Nil	ST resynchronised at 16:04hrs. During the outage of ST Plant availability declared as 205MW on Power and 2533.66 m3/hr on water.
133		South Batina	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132kV Muladhah -Khaburah line -2	Muladhah S/S: Dist. relay,Zone-1,A-N, Location: 31.6 km Khaburah S/S: Dist.relay, Zone-1, A-N, Location: 39.6 km Cause: Transient fault	23:39	ARC	Nil	Line tripped at 23:39hrs and auto reclosed from both sides. System back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
134		South Batina	132/33kV Muladhah S/S & 132/33kV Khabourah S/S 1) 132kV Muladhah -Khabourah line - 1 2) 132kV Muladhah -Khabourah line - 2	Muladhah S/S: 1st trip: Dist. relay,Z-1, B-N, Loc:33.9 km. 2nd trip: Dist. relay, Z-1,C-N,Loc:31.0 km Khabourah S/S: 1st trip: Dist.relay,Z-1, B-N, Loc:37 km 2nd trip: Dist.relay,Z-1, C-N, Loc:38.4 km Muladhah S/S: Dist. relay, Zone-1, C- N, Loc:30.7 km, Autoreclosed Khabourah S/S: Dist. relay, Zone-1, C- N, Loc: 39.3 km, Autoreclosed Cause: Transient fault	19:59 22:43 23:27 00:38	ARC ARC ARC ARC	Nil	At 19:59 hrs 132kV Muladah - Khabourah line-1 tripped from both sides and autoreclosed. At 22:43hrs line-1 tripped again and autoreclosed from both sides. At 23:27 hrs Muladah - Khabourah line-2 tripped and autoreclosed from both sides. At 00:38hrs line-2 tripped again and autoreclosed from both sides.
135		Sharquiya	132kV Al Kamil S/S & 132/33/11kV JBB Ali S/S 132kV Al Kamil- JBB Ali Ckt- 1	<u>Al-Kamil S/S</u> : Dist. Relay, Zone-1, A-phase,Fault location - 44.86 km. <u>JBB Ali S/S</u> : Trip Relay 1 & 2 Cause: Transient Fault	22:58	23:13	Nil	Auto reclosed at Al Kamil end and Manually closed at JBB Ali end.
		December						
136		Sharqiya	132/33kV Mudharib S/S & 132/33kV Mudhaibi S/S 132kV Mudharib -Mudhaibi line - 1	<u>MudharibS/S</u> : Dist. relay, Zone-1, C-N, Location: 40.86 km <u>Mudhaibi S/S</u> : Dist. relay,Zone-1, C-N, Location: 27.82 km Cause: Transient fault	0:27	ARC	Nil	Line tripped at 00:27hrs and auto reclosed from both sides. System back to normal.
137		South Batinah	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132KV Muladhah -Khabourah Ckt-1	Muladah SS :Distance Relay, Zone-1,(C-N) phase, Fault location- 31.2 Km Khabourah SS :Distance -Relay, Zone-1,(C-N) phase, Fault location- 38.5Km Cause: Transient Fault	0:25	ARC	NIL	Feeder autoreclosed from both ends

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
138		South Batina	132/33kV Muladhah S/S & 132/33kV Khabourah S/S 1) 132kV Muladhah -Khabourah line - 1	Muladhah S/S: 1st trip: Dist. relay,Z-1, C-N, Loc:31.2 km. 2nd & 3rd trip: Dist. relay, Z-1,C-N,Loc:31.5 km Khabourah S/S: 1st trip: Dist.relay,Z-1, C-N, Loc:37.9 km 2nd & 3rd trip: Dist.relay,Z-1, C-N, Loc:38.3 km Cause: Transient fault	01:14 01:55 03:08	ARC ARC ARC	Nil	At 01:14 hrs 132kV Muladah - Khabourah line-1 tripped from both sides and autoreclosed. At 01:55hrs & 03:08 line-1 tripped again and autoreclosed from both sides.
139		Sharqiya	132/33kV Mudharib S/S & 132/33kV Mudhaibi S/S 132kV Mudharib -Mudhaibi line - 1	MudharibS/S: Dist. relay, Zone-1, A-N, Location: 10.01 km Mudhaibi S/S: Dist. relay,Zone-2, A-N, Location: 60.08 km Cause: Transient fault	23:29	ARC	Nil	Line tripped at 23:29hrs and auto reclosed from both sides. System back to normal.
140		Muscat (14/12/05)	220/132/33 kV MSQ S/S 132kV Ghubrah- MSQ line-4 MSQ S/S: PLC failed indication	PLC fail indication	15:11	15:32	Nil	At 15:11 hrs 132 kV Ghubrah- MSQ line-4 tripped from MSQ S/S side. At 15:32 hrs 132 kV CB of Ghubrah-4 closed at MSQ S/S and system back to normal.
141		Muscat (15/12/05)	220/132/33 kV MSQ S/S 132 KV CB of 220/132kV 500 MVA TX-2	Trip Relay Cause: Trip occurred when protection team inadvertently checked Communication Panel-2 instead of Panel-1 as part of the maintenance job of 500MVA TX-1	17:42	17:47	Nil	17:42 hrs 132 kV I/C of 500MVA TX-2 tripped at MSQ S/S. At 17:47 hrs 132 kV CB of TX-2 closed at MSQ S/S and system back to normal.
142		North Batina (20/12/05)	132/33 kV Sohar S/S 132 KV Wadi Jizzi line-1	Indication: No indication Cause: Trip occurred when Protection team were doing relay testing for 132kV Sohar-Khburah line-1 at Sohar S/S	14:02	16:38	Nil	At 14:02hrs 132 kV Sohar-Wadi Al-Jizzi ckt-1 tripped at Sohar S/S and at 14:14 CB closed at test position. At 14:20hrs 132KV CB opened at test position at Sohar S/S. At 14:33hrs 132KV CB closed with load at Sohar S/S. At 16:26hrs 132kV Sohar-Wadi Al-Jizzi ckt-1 tripped again at Sohar S/S and CB closed at 16:38hrs. System back to normal.
143		North Batina (21/12/05)	132/33 kV Sohar S/S 132 KV Wadi Jizzi line-1	Indication: No indication Cause: Trip occurred when Protection team were doing relay testing for 132kV Sohar-Khburah line-1 at Sohar S/S	10:46	12:24	Nil	At 10:46 hrs 132 kV Sohar-Wadi Al-Jizzi ckt-1 tripped at Sohar S/S. At 11:09 hrs 132KV CB closed at Sohar S/S. At 12:17 hrs 132 kV Sohar-Wadi Al-Jizzi ckt-1 tripped at Sohar S/S. At 12:24 hrs 132 kV CB closed at Sohar S/S. System back to normal.

Annexure-4

INCIDENTS & SIGNIFICANT INCIDENTS

Incident Number	Significant Incident Number	Date	Substation & Fdr / TX	Indication / Cause	From	To	Areas affected	Action taken / Remarks
144		South Batina (25/12/05)	132/33kV Muladhah S/S & 132/33kV Khaburah S/S 132KV Muladhah -Khabourah Ckt-1	Muldah S/S: Dist. Relay, Zone-1, C-N, Location: 37.1 km, Khaburah S/S: Dist. Relay, Zone-1, C-N, Location: 33.7 km	23:46	ARC	Nil	At 23:46 hrs 132 kV Muladhah-Khaburah ckt -1 tripped from both sides and auto reclosed.
145		Sharquiya (27/12/05)	132kV Al Kamil S/S & 132/33kV JBB Ali S/S 132KV Al Kamil-JBB Ali line-2	Al Kamil S/S: Dist. Relay, Zone-1, C-N, Location: 37.5 km, Auto reclosed JBB Ali S/S: Trip Relay 1&2 Cause: Transient fault.	6:25	6:33	Nil	At 06:25 hrs 132 kV Al Kamil - JBB Ali S/S line-2 tripped from both sides and auto reclosed from Al Kamil S/S. At 06:33 hrs 125MVA TX-2 closed at JBB Ali S/S and system back to normal.
146		South Batina (28/12/05)	132/33kV Khaburah S/S 1. 132/33kV 125MVA TX-1 from both sides 2. 132kV Muladhah line-1	1. 132kV side - Trip Relay 1 & 2 , 33kV side - Master trip relay 2. Distance Relay, Zone-4 3. Bus Bar protection Panel 1 & 2 relays (Zone-1 , R,Y,B, Bus Coupler, Zone-1, Check Zone, R,Y,B) Cause: Suspect VT on 132kV Bus-1 faulty.	18:57	20:00	Nil	At 18:57 hrs 125MVA TX-1 tripped from both sides. At 18:57 hrs 132kV Muladhah line-1 tripped. At 19:48 hrs 125MVA TX-1 energized. At 20:00 hrs 132kV Muladhah line-1 normalized. System back to normal.