

[2003]114

2013 11

AQ8001-2007

397

8

"

1	.....	1
1.1	.....	1
1.2	.....	1
1.3	.....	4
1.4	.....	6
1.5	.....	13
2	.....	17
2.1	.....	17
2.2	.....	17
2.3	.....	29
2.4	.....	31
3	.....	33
3.1	.....	33
3.2	.....	38
3.3	.....	39
4	.....	41
4.1	.....	41
4.2	.....	44
4.3	.....	46
4.4	.....	48
4.5	.....	49
4.6	.....	51
4.7	.....	53
4.8	.....	54
4.9	.....	56
4.10	.....	58

4.11	.....	58
4.12	.....	59
5	.....	61
5.1	.....	61
5.2	.....	62
5.3	.....	63
5.4	.....	64
5.5	.....	64
5.6	.....	65
5.7	.....	68
5.8	.....	73
6	.....	74
6.1	.....	74
6.2	.....	76
6.3	.....	77
7	.....	79
7.1	.....	79
7.2	.....	79
7.3	.....	80
8	.....	86
8.1	.....	86
8.2	.....	87
8.3	.....	87
8.4	.....	89

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
8.
 - (1)
 - (2)
 - (3)
- 9.
- 10.
- 11.
- 12.

1

1.1

1.1.1

" "

60 /

1.1.2

1

2

3

1.2

1.2.1

1	2009	8	27
2	2009	8	27
3	2011	12	31
4	2009	8	27
5	2013	6	29

6						[1989]	22
7						[1991]	49
8		2008	10	28			
9				397			
10					1984	1	16
11		2010	12	20			
12						[2000]	296
13							[1996]
4							
14							
		[2004]	8				
15							[2009]22
16						[2009]	28
17						[2003]	6
18						[1995]	56
19		GB6722	2003				
20				GB50197-2005			
21		2011					
22		AQ1008-2007					
23		AQ8001-2007					
24						[2003]	114
25							[2004]56
26							
						[2002]	123
27							[2002]124
28							[2007]47
29							
		[2005]	8				

30	AQ1055-2008
31	[2007]59
32	[2008]161
33	[2008]175
34	[2009]142
35	[2012]
16	
36	
	[2007]25
37	
[2006]61	
38	
	[2008]39

1.2.2

1

2

3

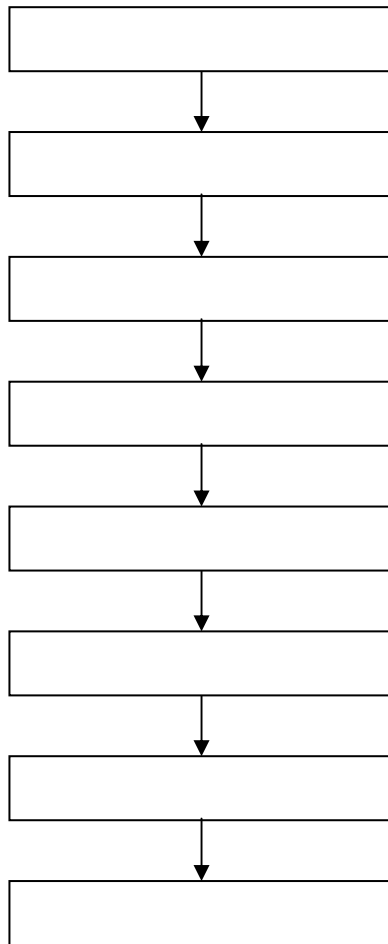
7

8

9

1.3

1.3-1



1.3-1

1

2

3

4

5

6

7

8

1.4

1.4.1

30km

8.5568km² 1348 1212m 0.6Mt/a
5542 t 2665 40a
—— 1.9m³ 20t

1.4.2

30km

110° 11 00 110° 13 45
39° 37 42 39° 40 32

1.4.3

15km 109

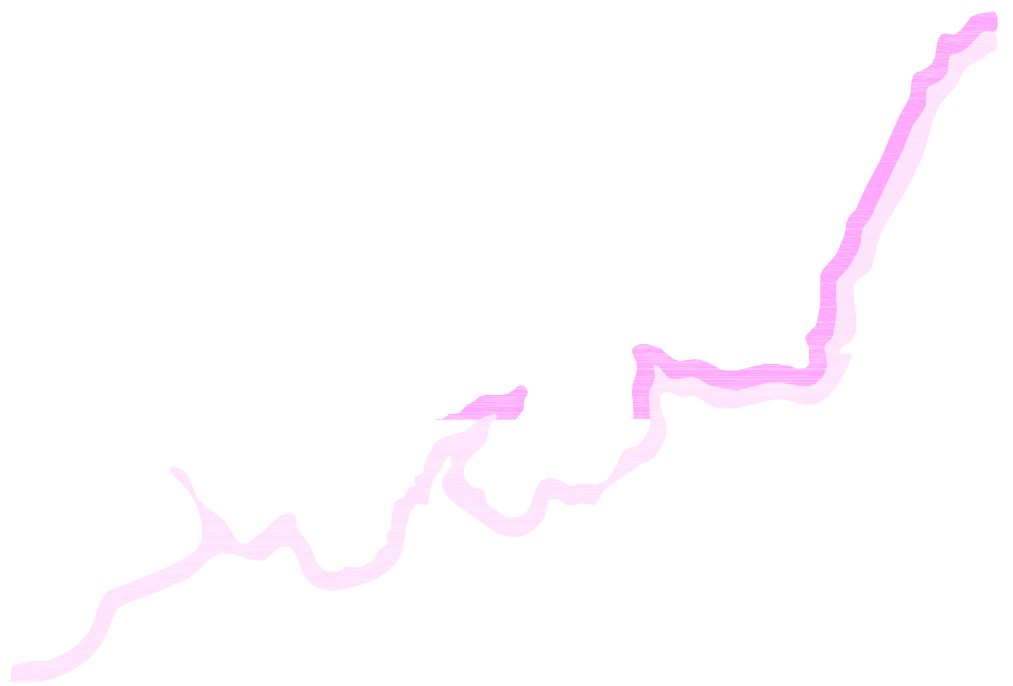
109 15km

109

20km

1.4-1

1348 1212m



1		Q_{3m}									
2		Q_4^{eol}									
3		Q_{3-4}									
	2m										
4		Q_{4al+pl}									
								1.84	9.77m		
	6.02m										
									1° 3°		
	()										
						J_{1-2y}	2	3	4	5	6
8	17	9	13			4					
1		J_{1-2y}^1									
				5	6	4	8			2	
38.10	67.47m	49.09m									
2		J_{1-2y}^2									
				3	4			2	6		2
49.49	77.69m	66.79m									
3		J_{1-2y}^3									
				2		1			23.94	27.80m,	
26.48m											
						J_{1-2y}			71.54	159.99m,	

128.92m

2 3 4 5

8 17

4.00 18.42m

4

2 3 4 5

1.4-1

1.4-1

	<u> </u>	<u> </u>	<u> </u>			
	<u> </u>	<u> </u>	<u> </u>			
2	<u>2.62 6.4</u> <u>4.4(3)</u>	<u>2.62 6.4</u> <u>4.4(3)</u>	<u>0</u> <u>0</u>	17.64 37.61		
3	<u>0.65 4.36</u> <u>2.60(7)</u>	<u>0.45 4.36</u> <u>2.57(7)</u>	<u>0</u> <u>0</u>	29.57(7) 28.02 37.56		
4	<u>0.27 3.02</u> <u>2.21(8)</u>	<u>0.27 3.02</u> <u>1.96(8)</u>	<u>0 1</u> <u>0.10 0.26</u>	32.21(8) 22.36 28.80		
5	<u>0.20 4.97</u> <u>2.46(9)</u>	<u>0.20 4.42</u> <u>2.11(9)</u>	<u>0 4</u> <u>0.08 0.75</u>	25.93(9)		

1

2

268 296

2

1.40 1.60g/cm³

3

1.30t/m³

4

1.33t/m³

5

1.35t/m³

6

1.39t/m³

1

0 16m

Q4al+pl

2.70 3.55m

2.30 2.65m

Q=0.18 0.38L/S

2

H04

2km

17.37m

39.51m

1326.51m

q=0.00499L/s.m

K=0.0246m/d

3

10m

4

0.00070L/s.m

K=0.023846m/d

1

2



H04
2.44 4.53% 1.95 8.24% 48
3.7 15.5Mpa 16.0 25.5Mpa 1.64
2.60 0.17 0.72
30Mpa

ROD 18 89% 66%
M 0.0096 0.076 0.043

5m 30 50m

" "

3 5

"

3

(1)

10m

(2)

70°

68°

(3)

8m

(4)

35-38m

4

-

43

5

1.9m³

1.5.2

1

2

3

8%

30M

12-18

9M.

3

11

43

FMX

6

5

20KM/H

1.5.3

1

-

2

1

1380m

3

+1330

+1340

1360

10-20m

60m

35°

0.6m

4%

1.5.4

1

1

2

3

1

3

+1330

+1340

1360

2

3

3

2

3

2

1.5.5

800

4

10

5

1.5.6

1

2-3m

1-2m

2

1.5.7

1.5.8

2 CTQ-D100YA2

110SCY

1.5.9

10kV

S9-80/10

50KW

1.5.10

1.5-1

1.5-1

	EC360BLC EC460BLC R305LC-7
	CTQ-D100YA2
	110SCY
	LG855 LG855B ZL50C ZL50CN LG953
	YT3621 ND3253 SX3251 SX3255 STL3500E TL853 TAS3500 SX3255UN384 ND3255B38 ND3250S ND3253B38 ZZ3251N3641C CA3252P2K2T1A
	100-65-250 WQ-80-80-37
	S9-80/10 S9-M-800/10
	110SCY

2

2.1

2.1.1

GB6441-1986

[2004]56

2.1.2

2.2

2.2.1

GB6441-1986

1

2

3

4

5

6

7

8

9

10

11

12

13

13

1

2

3

4

4

1

2

3

4

5

6

6

2.2.2

GB6441-1986

1

10 20m

1

6-2

()

29 29.8Mpa

()

14.6 17.6Mpa

2

3

4

60m

5

6

1

2

3

4

5

2

1

<1>

<2>

<3>

<4>

1

5

3

1

2

3

4

5

4

1

<1>

7 8

<2>

<3>

<4>

<5>

<6>

<7>

2

<1>

<2>

5

1

<1>

<2>

<3>

<4>

2

3

4

5

<1>

<2>

<3>

<4>

<5>

<6>

6

1

2

3

7

8

2m

60m

1

2

3

4

5

6

7

8

9

10

9

1

2

“ ”

3

4

5

6

7

8

9

10

11

12

10

1

2

3

4

5

6

7

8

11

1

2008 12

6-2[#]

2

3

4

5

12

13

14

15

16

40

2.2.3

2004

56

GB18218-2009

2.3

1

2

3

4

5

6

7

8

9

10

2.3-1

2.3-2

2.3-1

2.3-2

2.4

1

2

50m

3

4

5

6

7

3

8

3.1

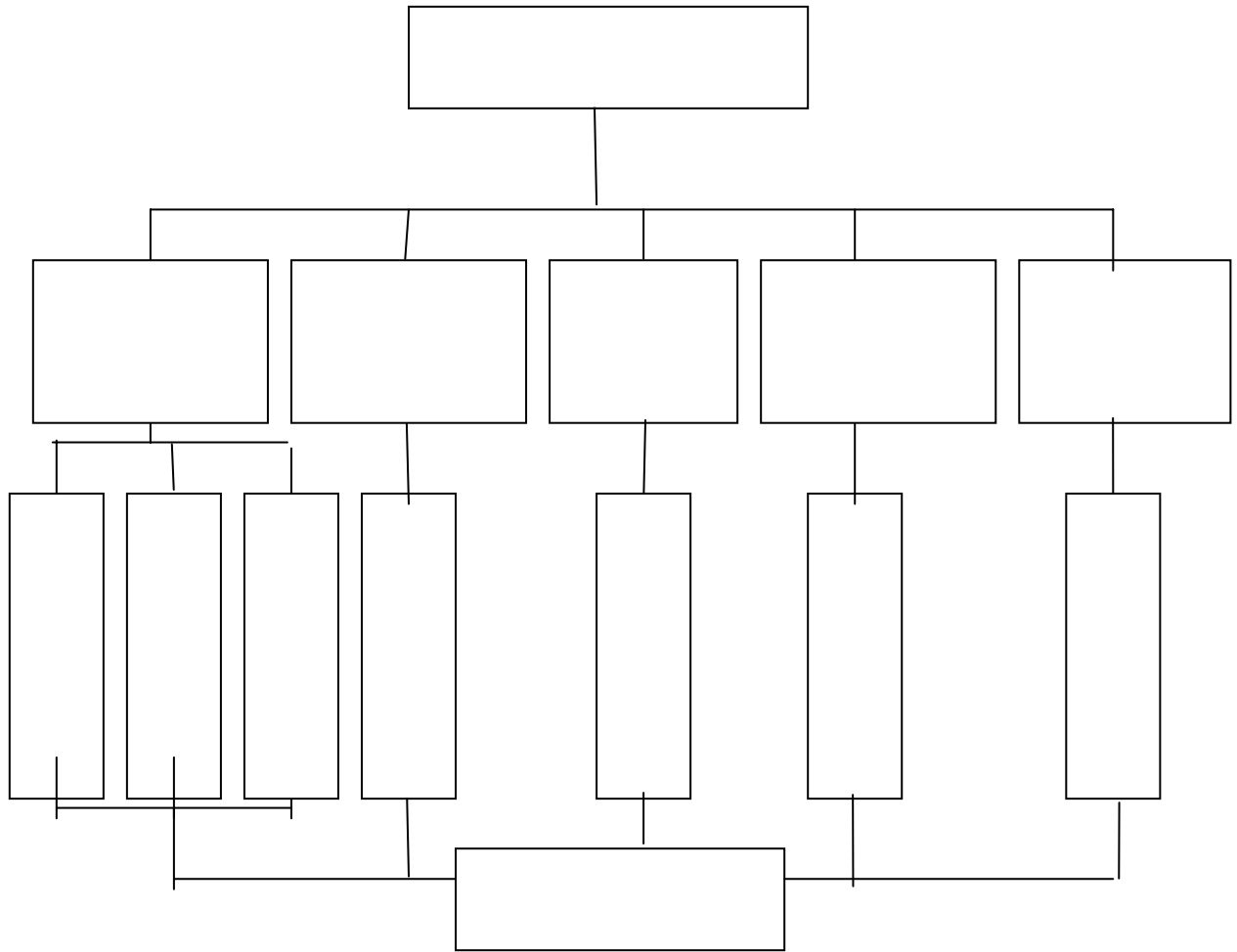
3.1.1

3.1-1

1			150000000004134 2013.12.01
2			1500002011061120113124 2013.12.1
3			201527230260
4			MK [2008]K187 2014.02.24
5			MK151003998 2015.12.24
			A150201115939 2015.12.24

3.1.2

3.1-1



3.1-1

3.1.3

1

2

3

4

”

”

3.1.4

“ ”

5

3.1.5

3.1-2

3.1-2

1				MK151003998	2015.12.24
				A150201115939	2015.12.24
2				B150201120473	2016.03.19
3				B150201112958	2016.07.19
4				B150201116005	2015.12.20
5				B150201110724	2015.04.01

3.1.6

107
3.1-3

3.1-3

1		6			
2		8			
3		6			
4		12			
5		69			
6		6			
7		107			

3.1.7

2013

3.1.8

2013

3.1.9

2013 10 600
60 650

3.1-4

3.1-5

3.1-4

	1.5	1	220	
	ZL50	1	25	
	5t	2	25	
		20	2	

			10	
	100	300	50	
		2000	20	
		800	8	
		2	2	
	50KW	1	10	
		4	20	
		2	6	
		2000	10	
			100	
		300	92	
			600	

3.1-5

	1.5	1	215	
	ZL50	1	24.3	
	5t	2	23.5	
		20	1	
			8.6	
	100	300	45	
		2000	12.5	
		800	2.3	
		2	2.5	
	50KW	1	8.6	
		4	16	
		2	5.2	
		2000	8	
			80	
		700	197.5	
			650	

3.1.10

3.1.11

3.1.12

3.1.13

3.1.14

3.2

3.2.1

8

3.2.2

3.3

3.3.1

1

2

3

4

3.3.2

4

4.1

4.1.1

AQ8001-2007

[2003]114

4.1.2

11

1

2

3

4

5

6

7

8

9

10

11

4.1.3

11

1 SCL

4.1-1

4.1-1

1			
2			
.....			

2 PHA
(Preliminary Hazard Analysis PHA)

4.1-2

4.1-2

- 1
- 2
- 3
- 4
- 5

4.1-3

4.1-3

3

Fault Tree Analysis FTA

-
- 1
 - 2
 - 3

 - 4

5

6

4.2

4.2.1

4.2.2

1

3 +1310 +1320 +1330 1

+1310 2.2-2.5m

2

3

(1) 10m

(2) 70° 68°

(3) 8m

(4) 35-38m

4

- 43

5

1.9m³

6

(1) EC360BLC EC460BLC R305LC-7 11

-
- (2) CTQ-D100YA2 2
 - (3) LG855 LG855B ZL50C ZL50CN LG953 6
 - 7

4.2.3

4.2-1

4.2-1

		10m	
		10 m	
	70° 70°	70° 68°	
		35-38m	
	8m	8m	
		~	

- 1 —
- 2
- 3
- 4
- 5
- 6

4.2.4

4.3

4.3.1

4.3.2

1

1

2

2

3

3

8%

30m

12~18m

9m

4

11

43

FMX

6

5

20KM/H

4.3.3

4.3-1

4.3-1

	1. 2. 3.	1. 2. 3.	
	1. 2. 3. 2/5 3/5 3m	1. 20t 12-18m 9m 2. 3. 0.6m 2/5 3.5m	

1

2

3

3

2/5-3/5

4

5

6

7

4.3.4

4.4

4.4.1

4.4.2

1

-

2

1

1380m

3

+1330 +1340 1360

10-20m

60m

35°

0.6m

4%

4.4.3

4.4-1

4.4-1

		1. 2. 3.	
		1. 2 2. 2 10m	

		2/5	0.6m
	5%	3%	4%

1

2

3

4

3%

5

6

7

2/5

4.4.4

4.5

4.5.1

4.5.2

1

(1)

(2)

(3)

2

1

2

3

		<p style="text-align: center;">" " " 4 +1340 +1360 " " 1-2 .</p>	

1

2

3

4

5

4.5.4

4.6

4.6.1

4.6.2

1

800

4

10

5

2

4.6.3

4.6-1

4.6-1

		2013 9 5	
		5 10t	

1

2 5 10t

4 800m³

3

4

5

4.6.4

4.7

4.7.1

4.7.2

1

2-3m

1-2m

2

1

3

4.7.3

4.7-1

4.7-1

		<p style="text-align: center;">3</p> <p>100-65-250 WQ-80-80-37</p> <p style="text-align: right;">3</p> <p style="text-align: center;">2013.9.14</p> <p style="text-align: right;">37KW× 3</p> <p>294.6m³/h</p>	

1

2

3

3

4

5

S9-80/10

50kw

4.7.4

4.8

4.8.1

4.8.2

1

2

CTQ-D100YA2

2#

4.8.3

4.8-1

4.8-1

1.	50m		
2.		1	
3.		2	
4.			
5.			
6.			
7.	200 400m		

1

2

3

4

4.8.4

4.9

4.9.1

4.9.2

10kV

S9-80/10

S9-M-800/10

50kw

4.9.3

4.9-1

4.9-1

--	--	--	--

4.10

4.10.1

4.10.2

2013

4.10.3

1

50km

5km

30min

2

4.10.4

4.11

4.11.1

1

2

3

4.11.2

1

2

3

4

4.11.3

1

2

3

4.11.4

4.12

4.12-1

4.12-1

1		
2		

3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

5

7

7

7

5.1

5.1.1

1

2

3

4

5

6

7

8

5.1.2

5.1-1

5.1.3

5.1-1

2-3

5.1-1

1				3	
1				3	
				50m	
2				2	

5.2

5.2.1

5.2-1

5.2-1

1				3	2/5 3% 5%
2				3	
				2-3	
				2-3	
3				3	
				2	

5.2.2

5.2-1

2-3

5.3

5.3.1

5.3-1

5.3-1

1				3	2/5 3% 5%
2				3	
				2-3	
				2-3	
3				3	
				2	

5.3.2

5.3-1

2-3

5.4

5.4.1

5.4-1

5.4-1

	1. 2. 3. 4.		3	1. 2. 3. 4. 5.

5.4.2

5.4-1

3

5.5

5.5.1

5.5-1

5.5-1

	1. 2. 3. 4.	1. 2.	2-3	1. 2. 3. 4. 5. 6. 7.
	1.	1. 2.	3	1. 2. 3.
	1. 2.	1. 2.	2-3	1. 2. 7 8 3. 4. 5.

5.5.2

5.5-1

2-3

5.6

5.6.1

5.6-1

5.6-1

			1-2	GB50057-1994
			2	
			2	

			1-2	
			2	
			3	

5.6-1

1-3

5.6.2

1

5.6-1

2

$$\begin{aligned}
 T &= A_1 \cdot A_2 \cdot A_3 = (B_1 + B_2)(X_7 + X_8)(X_9 + X_{10} + X_{11}) \\
 &= [X_1 + X_2 + C(X_3 + X_4 + X_5 + X_6)](X_7 + X_8)(X_9 + X_{10} + X_{11})
 \end{aligned}$$

36

~ X₈ X₉ X₁₀ X₁₁

5.6-1

3

$$I_{\phi}(i) = \sum_{X_i \in K_j} \frac{1}{2^{n_j - 1}}$$

$I_{\phi}(i)$ _____

$X_i K_j$ _____ X_i K_j

n_j _____

C 0.96

$I\varphi_1 = I\varphi_2 = 0.82$

$I\varphi_3 = I\varphi_4 = I\varphi_5 = I\varphi_6 = 0.55$

$I\varphi_7 = I\varphi_8 = 0.96$

$I\varphi_9 = I\varphi_{10} = I\varphi_{11} = 0.89$

$I\varphi_c = I\varphi_7 = I\varphi_8 \quad I\varphi_9 = I\varphi_{10} = I\varphi_{11} \quad I\varphi_1 = I\varphi_2$
 $I\varphi_3 = I\varphi_4 = I\varphi_5 = I\varphi_6$
4

36

C

X7 X8

X9

X10

X11

X1

X2

X3

5

1

2

3

4

5

5.7

5.7.1

1

2

5.7-1

5.7-1

1				3-4	
2				3-4	
3				3-4	
4				3-4	
5				3-4	

5.7.2

5.7-1

1

5.7-2

$$T = A_1 \cdot A_2$$

$$= B_1 + B_2 \cdot (X_6 + X_7 + X_8)$$

$$= [(X_1 + X_2) + X_3 + X_4 + X_5] \cdot X_6 + X_7 + X_8$$

15

2

$$I_\phi(6) = I_\phi(7) = I_\phi(8) > I_\phi(1) = I_\phi(2) = I_\phi(3) = I_\phi(4) = I_\phi(5)$$

3

15

4

1

2

3

4

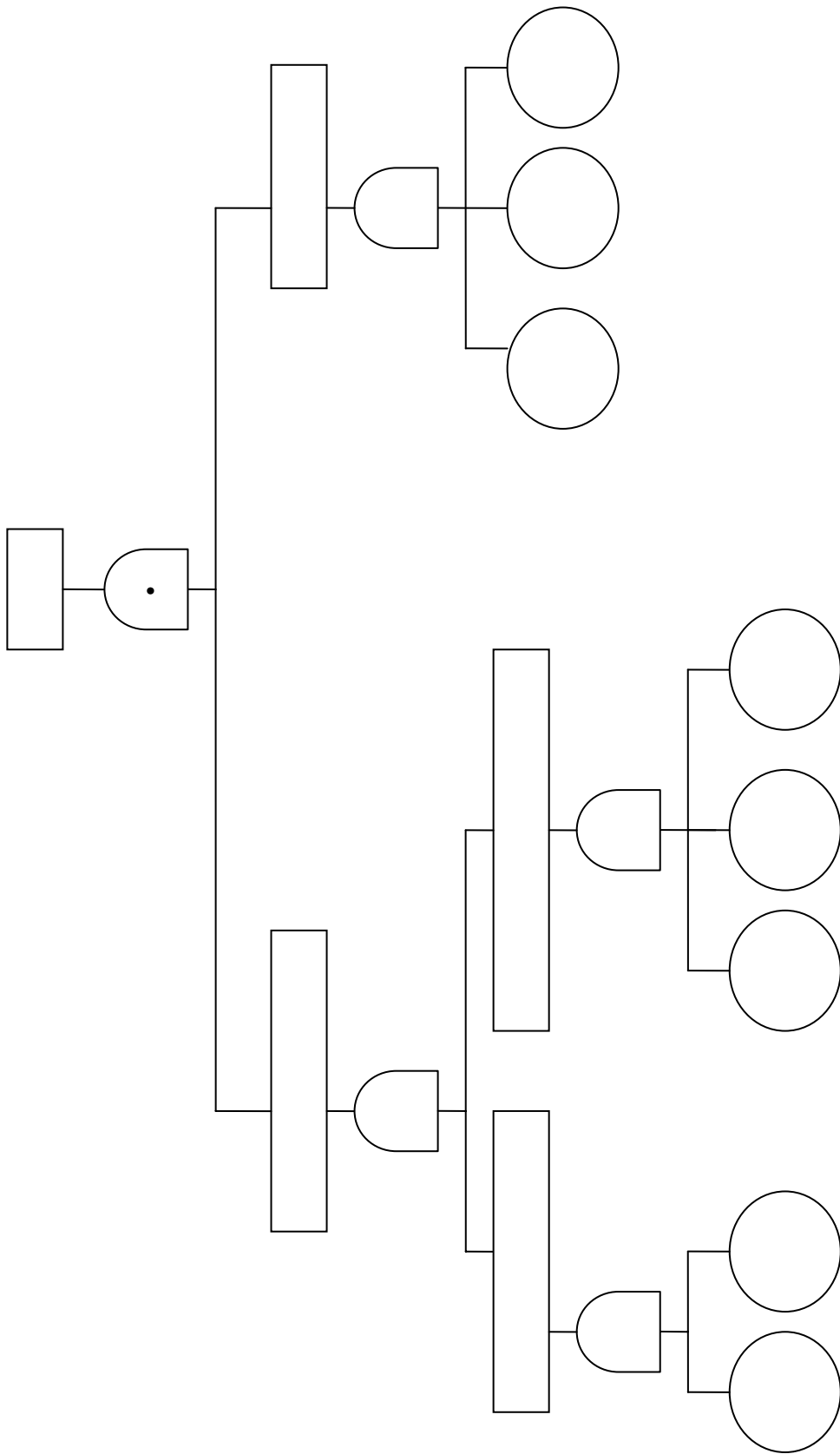
5.7.3

X_8

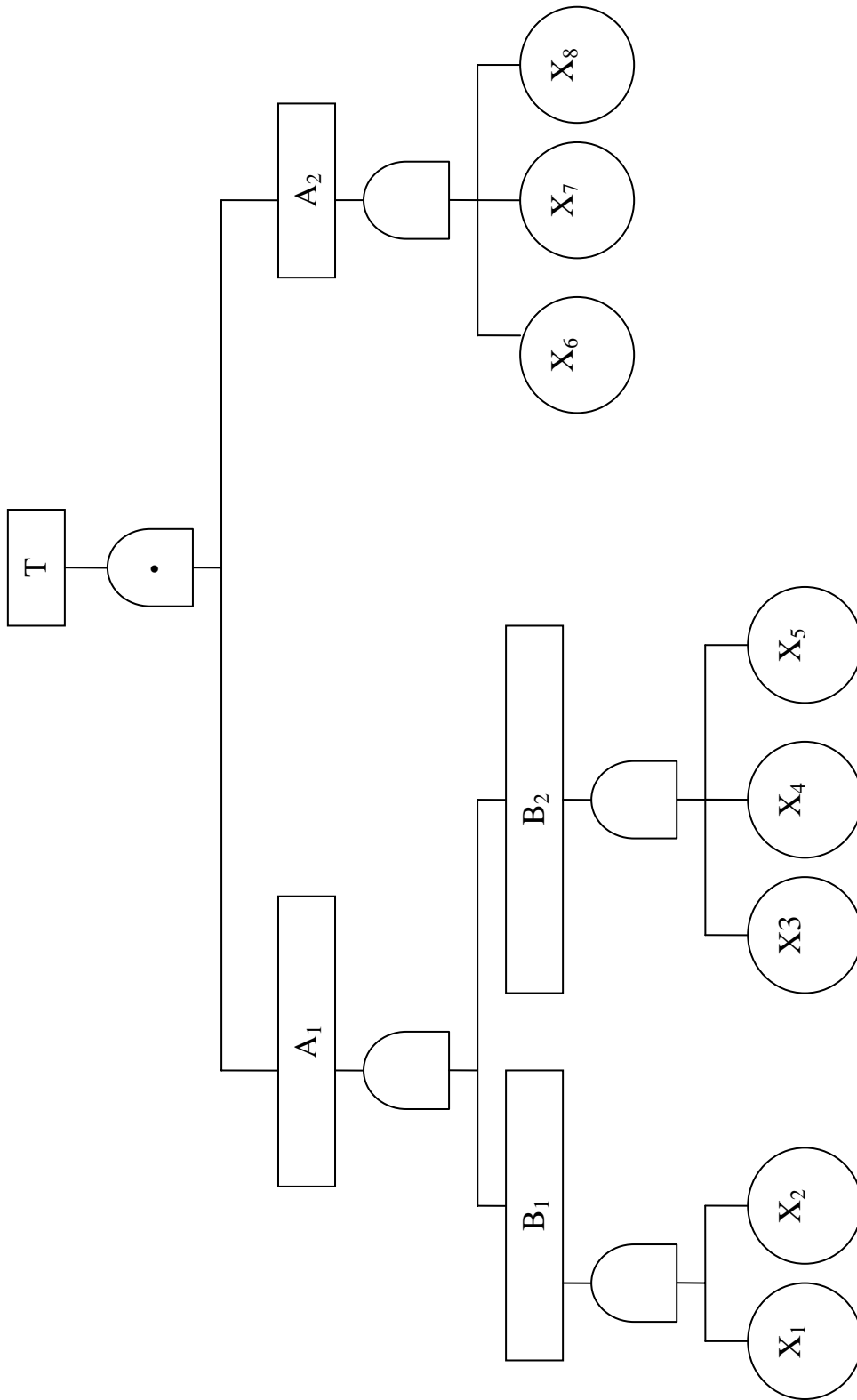
X_6

X_7

$X_1 \quad X_5$



5.7-1



5.7-2

5.8

5.8-1

5.8-1

	2-3	----
	2-3	----
	2-3	----
	3	
	2-3	----
	1-3	--
	3-4	—

W =max W W W W W W W W

W —

W —

W —

W —

W —

W —

W —

W =max 2-3 2-3 2-3 3 2-3 1-3 3-4 =3-4

3-4

6

6.1

6.1.1

1									
2007	4	1		10	15			1	
401									
1									
2									
3									
2									
2006	8	1		2	50			2	
		3							
3									
2007	5	27	20	30				4	
							5	28	3
4									
2008	10	16	18	15					

2011 9 29

1

2

3

1

2

“ ”

6.2

7

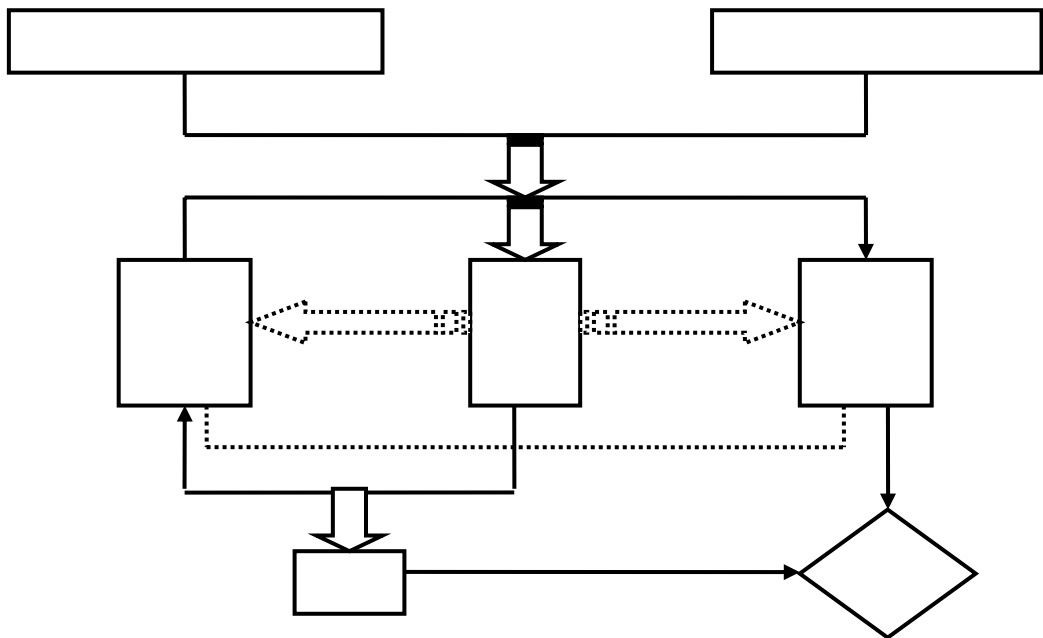
6.3

6.3.1

6.3-1

“ ”

“ ”



6.3-1

“ ”

“

”

6.3.2

1

2

3

3

1

2

3

2-3

4

2-3

4

7

7.1

,

1

2 50m

50

3

4

5

6

7

7.2

1

2

“ ”

3

4

5

6

7

8

9

10

7.3

7.3.1

1

2

20m

0.5m

1.0m

3

2.5m

4

120°

5

30m

6

30m

7

8

9

10

11

12

7.3.2

1

2

3

10 20m

4

5

45°

6

7.3.3

1

2

20m

7m

3

4

2/5

3% 5%

5

6

7.3.4

1

2

3

4

5

6

7

8

50m

7.3.5

1

2

3

4

5

6

7

8

9

7.3.6

1

2

3

0.5m

4

5

6m

6

7

7.3.7

1

2

3

7.3.8

1

2

GB6722-20030

3

4

5

6

7

7.3.9

1

2

3

4

5

50kw

7.3.10

1

2

3

4

8

8.1

3
2-3 ---
2-3
 2-3 --
2-3 --
1-3
3-4

3-4

8.2

1

2

3

3

4

8.3

8

1

2

3

4

6

5

6

7

8

[2012] 16)

9

10

11

12

1

2

3

4

5

6

4 800m³

7

8

9

10

11

12

13

14

8.4