DEPLOYMENT LOG for IceCube STRING # 56

Deployment Start: *at* 10:12 *on* 1/28/07

Deployment End: *at* 8:01 *on* 1/29/07

Target depth (DOM60): **2450** m Final depth: 2451.04

Deployment Crew

Position	First Shift	Second Shift
Shift lead	A. KARLE	T. Ham
DOM install 1 (high)	G. KOHNEN	
DOM install 2 (low)	P. ROTH	
DOM supply 1 / DOM install 3	C. PETERSON	Juan
DOM supply 2 / floater	S. BÖSER	
Winch operator (cable & tower)	D. BLYTHE	
Notary (logbook & photos)	M. D'AGOSTINO	Justin
PTS (monitoring / sensors)	M. D'AGOSTINO	

shift change: 7 Am

56

9 hrs 1 hrs

7

Driller

Hole Handover

☐ Drill data reviewed

- ☐ maximum drift in x:_____ ☐ plot
- ☐ maximum drift in y:_____ ☐ plot
- ☐ maximum depth:_____
- ☐ minimum radius:_____ ☐ plot
- ☐ plot of predicted radius vs depth and time

☐ Hole dimensions verified Time:_____

Drill Lead: _____
name / signature / date

Deployment Lead: _____
name / signature / date

☐ Handover complete

Hole Logging
(skip if not applicable)

☐ Logger drop started Time:_____ Speed:_____
☐ Logging started Time:_____ Speed:_____
☐ Logging ended Time:_____

☐ Estimated hole lifetime:_____

► Must reach target depth by _____ on _____

Deployment Startup

Time:_____

☑ Cable winch anchored and ☑ operational
☐ Tower winch operational
☑ Tie off verified
☑ Yellow rope verified

☑ Deployment monitoring system (PTS) operational ☑ DDB# 3
☒ Pressure sensors on hand: Paro and Keller, with backups
☒ Laser ranger, tape measure (metric) on hand

☑ Bleeder string installed (on quad connectors inside cable reel drum)

☐ Uphole pressure system on hand: Setra sensor and cable

☑ DOMs placed in racks
☑ Weight stack on hand: weights (5) and 2 m cable
☑ 17 m string extension steel cable on hand

Safety checks complete (☐ 1st shift ☐ 2nd shift)
☑ ☐ Crew safety briefing
☑ ☐ E-stop locations identified
☑ ☐ TOS evacuation procedures reviewed
☑ ☐ Mustering point identified
☑ ☐ Snow mobile driver(s): PIACENTINO, KLEIST
☑ ☐ CPR trained: KLEIST, ROTH
☐ ☐ Food runners: _____
call galley at 65521
☑ End of Main Cable brought into TOS and secured

Cable end attachments

☐ Measure well depth: 52.598
☑ Weights (5) attached
☑ Weight cable attached (weight stack complete) Time: 10:15

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 60 DOM id: ~~TP~~ AP 4P0067

(T, Long)

☑ Bottom shackle connected to weight stack Payout: 0.00

☑ Top shackle connected to 17 m steel cable

Photos: ☐ whole view

DOM position 59 DOM id: UP 5H0176

(U, Short) Cable mark: 1.5m

☑ Bottom shackle connected to 17 m cable

☑ Top shackle connected to Yale grip Δ(59-60): 17.861 (use laser ranger)

☑ Main cable end taped to 17 m steel cable

Photos: ☐ phi orientation ☐ whole view

Breakout 30 Time: 11:00

Depth:

Payout 21.65

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

Paro Serial #: 98108 ↙ generized Nipple ☐ on ☐ off

☑ Connected ☑ Operational ☐ Air pressure [PSI]: 8.55

☐ Cable mark: _____ ☐ Distance to DOM59: .748 m above DOM 59

18,669 to DOM 66

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 58 DOM id: TP 5P0615

(T, Long) Cable mark: 19

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(58-59): 16.802
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 57 DOM id: UP 5H0102

(U, Short) Cable mark: 35

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(57-58): 16.902
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 29

Time:
Now 11:20
Last b/o
Δt [min]

Depth:
Paro 71.26
Payout 52.43

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 56 DOM id: TP 5P0987

(T, Long) Cable mark: 53

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(56-57): 16.932
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 55 DOM id: UP 5P0674

(U, Short) Cable mark: 69

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(55-56): 16.858
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 28 Time:

Now 11:31
Last b/o
Δt [min]

Depth:
Paro 86.79
Payout 86.34

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 54 DOM id: TP 64257

(T, Long) Cable mark: 86

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(54-55): 16.919
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 53 DOM id: UP 5P0690

(U, Short) Cable mark: 103

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(53-54): 16.925
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 27 Time:

Now 11:45
Last b/o
Δt [min]

Depth:
Paro [illegible] 124.95
Payout 123.24

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 52 DOM id: TP 6P1265

(T, Long) Cable mark: 121

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(52-53): 16.980
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 51 DOM id: UP 6P1308

(U, Short) Cable mark: 137

☐ Bottom shackle connected
☐ Top clutch connected at link # 20 Δ(51-52): 16.874
☐ Bow OK → ☐ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 26 Time:

Now 11:55
Last b/o
Δt [min]

Depth:
Paro 154.18
Payout 151.70

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 50 DOM id: ~~TP~~ AP 4P0071

(T, Long) Cable mark: 154

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(50-51): 16.974
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view
☐ Curved distance around DOM:_____ ☐ Vertical distance:_____

DOM position 49 DOM id: UP 5H0154

(U, Short) Cable mark: 171

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(49-50): 16.878
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view
☐ Curved distance around DOM:_____ ☐ Vertical distance:_____

Breakout 25

Time:
Now 1:25 (after lunch)
Last b/o _____
Δt [min] _____

Depth:
Paro 189.36
Payout 184.89

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 48

DOM id: TP 6Y4363

(T, Long) Cable mark: 188

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(48-49): 16,999
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 47

DOM id: UP 5P1038

(U, Short) Cable mark: 205

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(47-48): 16,921
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 24

Time:

Now 1:35
Last b/o
Δt [min]

Depth:
Paro 223.08
Payout 217.61

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 46

DOM id: TP 4P0263

(T, Long) Cable mark: 222

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(46-47): 16.940
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 45

DOM id: UP 6P1276

(U, Short) Cable mark: 239

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(45-46): 16.882
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 23

Time:

Now 1:45
Last b/o
Δt [min]

Depth:
Paro 257.37
Payout 251.00

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 44

DOM id: TP 5P0905

(T, Long) Cable mark: 256

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(44-45): 16.936
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 43

DOM id: UP 6P1220

(U, Short) Cable mark: 273

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(43-44): 16.883
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 22

Time:
Now 1:55
Last b/o
Δt [min]

Depth:
Paro 291.77
Payout 284.34

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 42 DOM id: TP 5H0107

(T, Long) Cable mark: 290

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(42-43): 16.999
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 41 DOM id: UP 5H0248

(U, Short) Cable mark: 307

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(41-42): 16.905
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 21

Time:
Now 2:02
Last b/o
Δt [min]
Depth:
Paro 325.58
Payout 317.31

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 40

DOM id: TP 644447

(T, Long) Cable mark: 324

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(40-41): 16.928
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 39

DOM id: UP 540144

(U, Short) Cable mark: 340

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(39-40): 16.905
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 20

Time:

Now 2:10
Last b/o
Δt [min]

Depth:
Paro 359.85
Payout 350.51

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 38 DOM id: TP 6P1247

(T, Long) Cable mark: 357

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(38-39): 16.930
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 37 DOM id: UP 6P1208

(U, Short) Cable mark: 374

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(37-38): 16.905
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 19

Time:
Now 2:20
Last b/o
Δt [min]

Depth:
Paro 394.00
Payout 383.64

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 36 DOM id: TP 5P1017

(T, Long) Cable mark: 391

☑ Bottom shackle connected
☑ Top clutch connected at link # 19 Δ(36-37): 16.950
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 35 DOM id: UP 4P0296

(U, Short) Cable mark: 408

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(35-36): 16.952
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 18 Time:

Now 2:30
Last b/o
Δt [min]

Depth:
Paro 428.11
Payout 416.81

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ Put two Kellers (one is for backup) in bucket of water/ice mix

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 34 DOM id: TP 6P1255

(T, Long) Cable mark: 425

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(34-35): 16.961
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 33 DOM id: UP 5P0500

(U, Short) Cable mark: 442

☑ Bottom shackle connected
☐ Top clutch connected at link # 20 Δ(33-34): 16.920
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 17 Time:

Now 2:40
Last b/o
Δt [min]

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

Depth:
Paro 462.41
Payout 450.00

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 32 DOM id: TP 4H0014

(T, Long) Cable mark: 459

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(32-33): 16.944
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 31 DOM id: UP 6P1216

(U, Short) Cable mark: 476

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(31-32): 16.895
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 16

Time:
Now 3:05
Last b/o
Δt [min]

Depth:
Paro 496.93
Payout 483.43

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 30 DOM id: TP 5P1007

(T, Long) Cable mark: 493

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(30-31): 16.937
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

BROKEN CONNECTOR

DOM position 29 DOM id: UP 5P0722

(U, Short) Cable mark: 510

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(29-30): 16.923
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 15

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

~~**Thermistor** ☐ Present ☐ Distance to DOM29:~~

Keller ☑ Connected ☑ Operational ☐ Air pressure [PSI]: ~1030
Ser.#: 0606740 ☐ Cable mark: ☐ Distance to DOM29:

☐ All clear to lower cable ☺

~706 above DOM 29

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 28 DOM id: TP 6P1285

(T, Long) Cable mark: 527

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(28-29): 16.976
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 27 DOM id: UP 5H0142

(U, Short) Cable mark: 544

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(27-28): 16.916
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 14 Time:

Now 3:30
Last b/o
Δt [min]

Depth:
Paro 565.47
Keller 580.30
Payout 550.09

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 26 DOM id: TP 6P1387

(T, Long) Cable mark: 561

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(26-27): 16.982
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 25 DOM id: UP 5P0566

(U, Short) Cable mark: 578

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(25-26): 16.941
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 13 Time:

Now 3:41
Last b/o
Δt [min]

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

Depth:
Paro 599.47
Keller 600.12
Payout 583.19

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 24 DOM id: TP 6P1309

(T, Long) Cable mark: 595

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(24-25): 16.974
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

BROKEN CONNECTOR

DOM position 23 DOM id: UP 6P1510

(U, Short) Cable mark: 612

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(23-24): 16.888
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 12

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

Last
Δt [
K
Pa

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 22 DOM id: TP 5H0139

(T, Long) Cable mark: 629

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(22-23): 16.935
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 21 DOM id: UP 5P1000

(U, Short) Cable mark: 645

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(21-22): 16.916
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 11

Time:
Now 4:00
Last b/o
Δt [min]

Depth:
Paro 668.01
Keller 668.55
Payout 649.95

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 20 DOM id: TP 644273

(T, Long) Cable mark: 663

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(20-21): 16.990
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view
☐ Curved distance around DOM:_____ ☐ Vertical distance:_____

DOM position 19 DOM id: UP SP1062

(U, Short) Cable mark: 679

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(19-20): 16.926
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view
☐ Curved distance around DOM:_____ ☐ Vertical distance:_____

Breakout 10

Time:
Now 4:11
Last b/o _____
Δt [min]_____

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

Depth:
Paro 702.25
Keller 702.75
Payout 683.38

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 18 DOM id: TP 6P1295

(T, Long) Cable mark: 697

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(18-19): 16.990
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 17 DOM id: UP 644324

(U, Short) Cable mark: 713

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(17-18): 16.945
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 9 Time:

Now 4:25
Last b/o
Δt [min]

Depth:
Paro 736.33
Keller 736.95
Payout 716.62

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 16 DOM id: TP 5P0991

(T, Long) Cable mark: 730

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(16-17): 16.928
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 15 DOM id: UP 6P1252

(U, Short) Cable mark: 747

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(15-16): 16.890
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 8

Time:
Now 4:36
Last b/o
Δt [min]

Depth:
Paro 770.51
Keller 771.15
Payout 749.91

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 14 DOM id: TP 6P1259

(T, Long) Cable mark: 765

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(14-15): 16.954
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 13 DOM id: UP 5H0240

(U, Short) Cable mark: 781

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(13-14): 16.918
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 7

Time:
Now 4:45
Last b/o
Δt [min]

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

Depth:
Paro 804.63
Keller 804.43
Payout 783.11

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 12

DOM id: TP 64 4373

(T, Long) Cable mark: 798

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(12-13): 16.955
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 11

DOM id: UP 5P0782

(U, Short) Cable mark: 815

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(11-12): 16.902
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 6

Time:
Now 4:59
Last b/o
Δt [min]

Depth:
Paro 839.14
Keller 839.50
Payout 816.79

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 10 DOM id: TP 64 4383

(T, Long) Cable mark: 832

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(10-11): 16.953
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 9 DOM id: UP 64 4464

(U, Short) Cable mark: 849

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(9-10): 16.900
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 5

Time:
Now 5:15
Last b/o
Δt [min]

Depth:
Paro 873.15
Keller 873.68
Payout 849.67

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 8 DOM id: TP 64479

(T, Long) Cable mark: 867

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(8-9): 16.974
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 7 DOM id: UP 5H0134

(U, Short) Cable mark: 883

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(7-8): 16.888
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 4

Time:
Now 5:24
Last b/o
Δt [min]

Depth:
Paro 907.30
Keller 907.85
Payout 983.05

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 6 DOM id: TP 6P1275

(T, Long) Cable mark: 900

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(6-7): 16.931
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 5 DOM id: UP 5P0700

(U, Short) Cable mark: 917

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(5-6): 16.923
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Breakout 3

Time:
Now 5:33
Last b/o
Δt [min]

Depth:
Paro 941.51
Keller 942.02
Payout 916.37

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected
- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 4 DOM id: TP 6P4287

(T, Long) Cable mark: 934 934

bent harness so we replaced it. 54014 3

☑ Bottom shackle connected

☑ Top clutch connected at link # 18 Δ(4-5): 16.977 16.948

☑ Bow OK → ☑ clutch zip tied

Photos: ☐ phi orientation ☐ whole view

DOM position 3 DOM id: UP 6P1380

(U, Short) Cable mark: 951

☑ Bottom shackle connected

☑ Top clutch connected at link # 20 Δ(3-4)

☑ Bow OK → ☑ clutch zip tied

Photos: ☐ phi orientation ☐ whole view

Breakout 2

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

La

Δt

K

Payout 949.83

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

☐ All clear to lower cable ☺

Photos: DOM ids (☐ long ☐ short); connectors (☐ long ☐ short)

DOM position 2 DOM id: TP 5H0131

(T, Long) Cable mark: 968

☑ Bottom shackle connected
☑ Top clutch connected at link # 18 Δ(2-3):
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

DOM position 1 DO

(U, Short) Cable mark: 984

☑ Bottom shackle connected
☑ Top clutch connected at link # 20 Δ(1-2):
☑ Bow OK → ☑ clutch zip tied
Photos: ☐ phi orientation ☐ whole view

Could this be 0139?

Breakout 1

Time:

Now 6:06
Last b/o
Δt [min]

- LongDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

Depth:
Paro 1010.04
Keller 1016.33
Payout 983.19

- ShortDOM
  - ☐ connector O-ring in place and ☐ lubed
  - ☐ breakout O-ring in place and ☐ lubed
  - ☐ connected

☐ Loose pigtails taped to cable

No second Paro no more…

☑ Group photo

☐ All clear to lower cable ☺

Uphole Pressure Sensor (Setra)

After DOM1 is safely under the surface (> 50 m)

Time: 6:16

☑ Stop the cable winch

☐ ~~Lower Setra pressure sensor into hole~~

☐ ~~Distance to Setra from floor:~~ _____

☐ ~~Setra readout verified with monitoring system~~

☐ ~~Well depth from Setra:~~ _____

☐ Well depth from laser: 44,831

If the two well depth measurements agree:

☐ Switch to Setra well depth in monitoring system

Time: _____

Now the String Drop begins

String Drop

*The target depth is **2450** m*

☐ Switch cable winch to computer control

☐ Speed:________ Time:________ Depth:________
☐ Speed:________ Time:________ Depth:________
☐ Speed:________ Time:________ Depth:________
☐ Speed:________ Time:________ Depth:________
☐ Speed:________ Time:________ Depth:________
☐ Speed:________ Time:________ Depth:________

Depth Monitoring (log on the fly – do not stop for this)

Depth by Paro[1]	Time	Well depth[1]	Depth by cable marks[2]	Depth by Payout[1]	Δdepth P-K[1]
~~1000 m~~					
~~1500 m~~					
~~2000 m~~ 1999.84	7:05	44.316	1974	1958.18	-1.13
~~2100 m~~					
2200 m 2199.69	7:20	43.196	2173	2153.60	-0.57
~~2300 m~~					
~~2400 m~~ 2445.11	7:40	42.874	2417	2395.00	-0.60

(margin note: Pay order of shuffled lead Karle)

[1]Read off monitoring screen
[2]Cable mark offset = 1.5 (from p.4) (at DOM59) – ~~17~~ 17.861 m = -16.361 (at DOM60)

☐ Switch to manual control @ 2400 m

☐ Well depth
~~@ 2420:~~________
@ 2440: 42.874

☑ Position string at target depth of **2450** m 2445.11 Time: 7:40

☑ String secured with Yale grip and anchor chain Time: 8:01

Absolute depth with bottom Paro
(depth in *meters* and pressure in *PSI*)

☐ Distance from Paro to DOM60:

$d_{Paro\text{-}DOM59}$ = ~~17.861~~ .748 (from p. 4)

$d_{Paro\text{-}DOM60}$ = ($d_{Paro\text{-}DOM59}$ + ~~17~~ 17.861) m = 18.609 ← insert below

☐ Convert Paro pressure to string depth:

$K = 3.78151 \cdot 10^{-6}$ /PSI (compressibility of aerated water)

(use 6 decimals for exp's)

Ambient pressure (from p. 4): P_0 = _____ PSI → $\exp(-KP_0)$ = _____

Pressure reading (from screen): P = _____ PSI → exp(-KP) = _____

Subtract exponentials → = _____

× $1.85947 \cdot 10^5$

Paro depth in water → = _____ m

Add distance to DOM60 (above) → + _____ m

Add well depth → + _____ m

Depth of bottom DOM → = _____ m

Final depth estimates

◄---------- read off deployment screen ---------►

Time:	Paro	Keller	Payout	Cable marks
Reading	3429.90 PSI	2678.35 PSI	2587.81 m	2423 m
Offset	9.44 PSI	-10.30 PSI	186.95 m	-16.361 m
Well depth	m		This space is intentionally left blank	
Dist. to DOM60	18.609 m	527.706 m		
DEPTH (DOM60)	2451.04	2451.63	2460.86	2439.361

Time: 8:01

Final depth (DOM60): 2451.04

Deployment Closeout

- [x] Log entries complete
- [x] String safely secured
- [x] Hole covered and secured
- [x] Equipment safely shutdown and secured
- [x] Deployment data OK (in database)
- [x] Site cleanup
- [x] Deployment crew dismissed
- [x] String deployment complete

Time: 8:01 Date: 1/29/07

Shift Lead: _____
name / signature

Logger: _____
name / signature

PTS Lead: _____
name / signature

Deployment Manager: _____
name / signature

Safety Officer: _____
name / signature

IceCube On-ice Lead: _____
name / signature

56?

IceCube Deployment Monitoring Check Sheet (IDMCS)

Version 4.0
December 12, 2006

Kurt Woschnagg, UCB

General instructions

- Read through this entire document before deployment starts.
- Deployment monitoring is done with a computer (housed in the TOS) running drill/deployment monitoring software (by Chuck Rentmeesters) with a GUI for readout and manual inputs. All deployment sensor data and manual inputs are logged and saved on disk by this system.
- For each manual entry into the monitoring interface (marked **ENTER** below), also make a note in the logbook (marked *Logbook* below).
- For each entry in the logbook, include time and name (initials).
- Write down as much useful information you can think of (it *will* all be needed sooner or later).

Measurement instructions

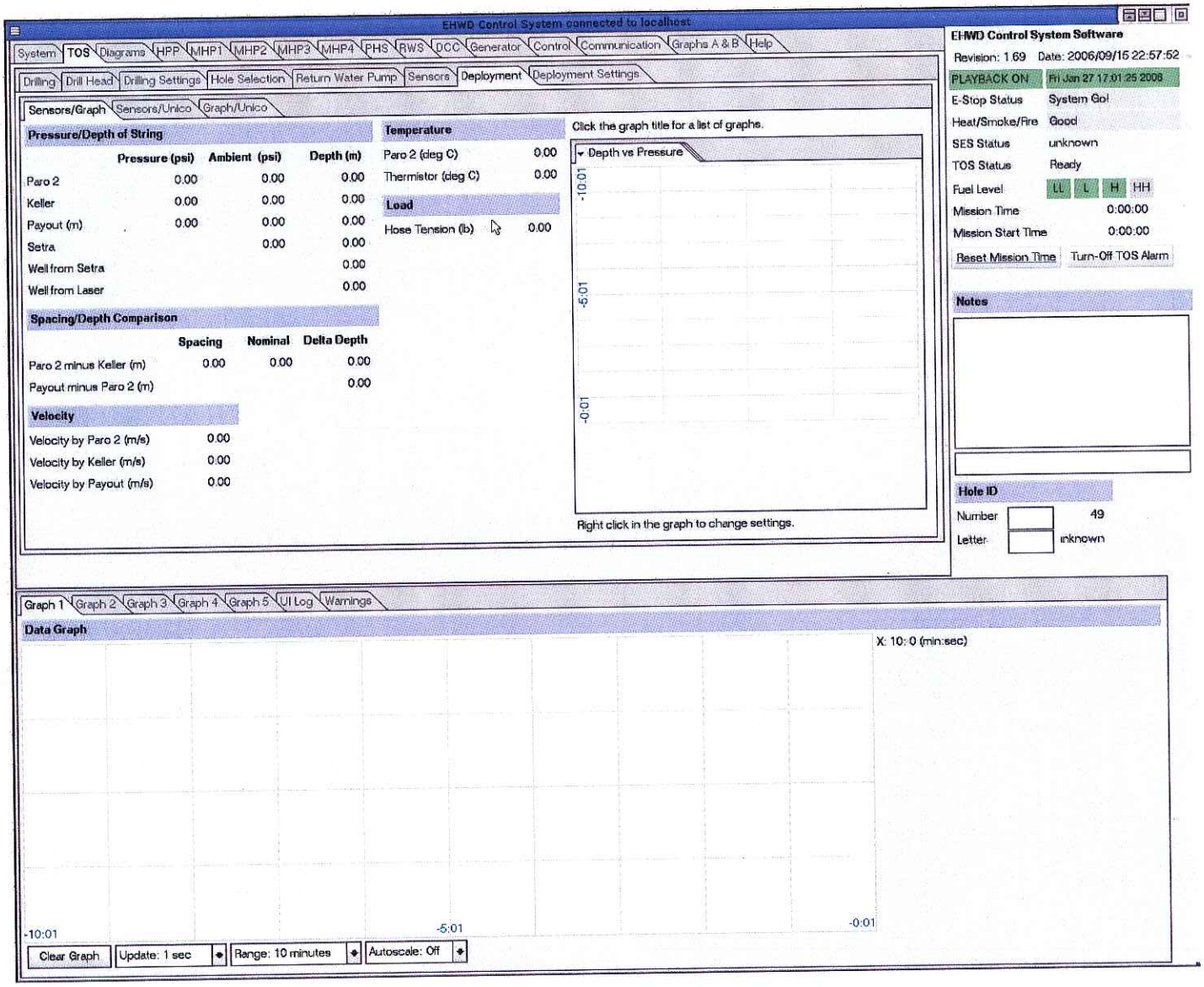
- All vertical measurements are relative to the floor of the tower (not the lip of the kick board).
  - Measure well depth from this level.
  - Take cable mark readings at this level.
- The location of a DOM on a string (for distance measurements) is defined as the position of the center of the sphere (at the equator defined by the harness).
- When taking a cable mark reading, estimate the location to nearest cm (0.01 m) with closest cable marks and tape measure.
- The location of a Paro is defined at the bottom of its body (at the little hole with the nipple).
- The location of a Keller is defined at the row of holes in the black plastic nose cap.
- The distance between a pressure sensor and the nearest DOM is positive/negative if the unit is above/below the DOM.
- Well depth is measured with a laser ranger (if possible), or with a tape measure (if not).
- The unit used for all distances and depths during deployment is **meters**.

Screen Tab: TOS ▶ Deployment

▶ Sensors/Graph

This is the main tab used during deployment monitoring. No input required on this tab.

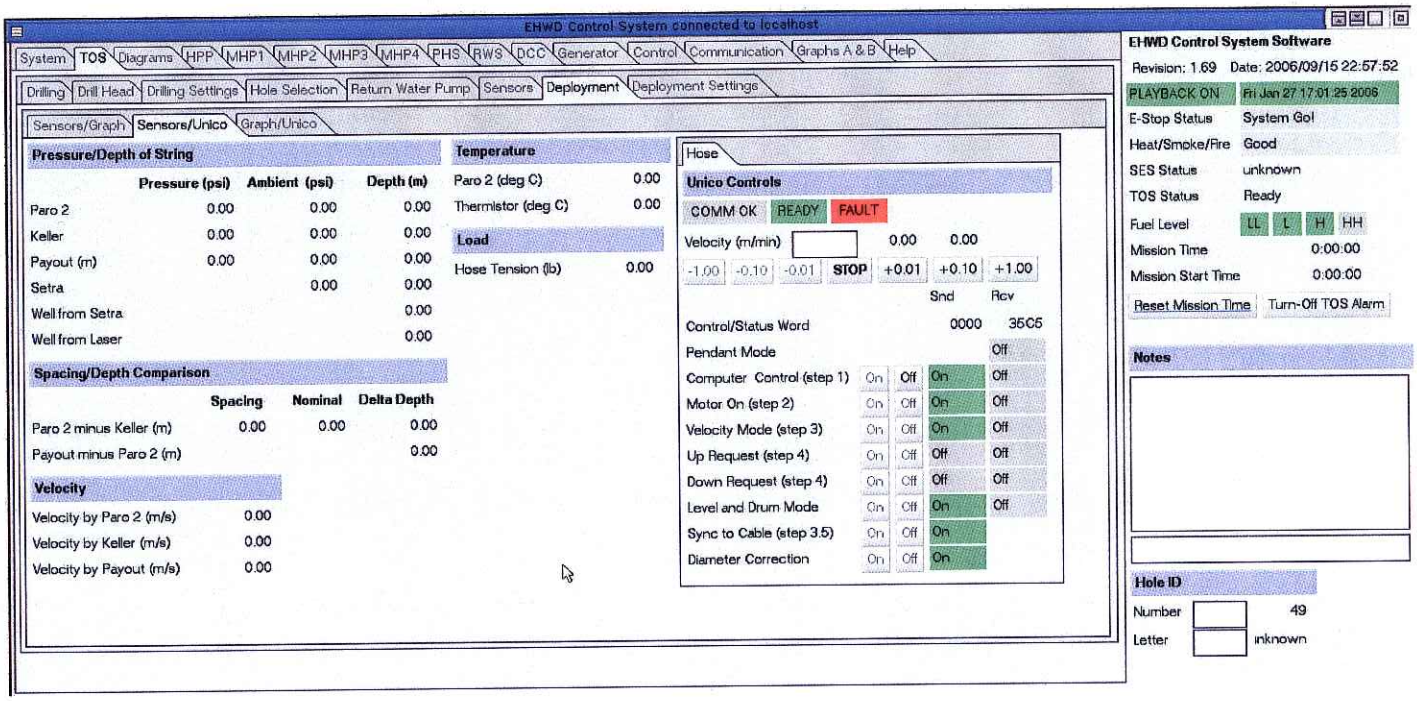
Pressure/Depth of String Current and ambient (air) pressures, and the corrected depths at DOM60.
Spacing/Depth Comparison Difference in depth from pressure data. *Should be stable during deployment!*
Velocity The deployment velocity calculated from recent pressure/payout readings.
Temperature Temperature readings.
Load Cable tension from load cell data.



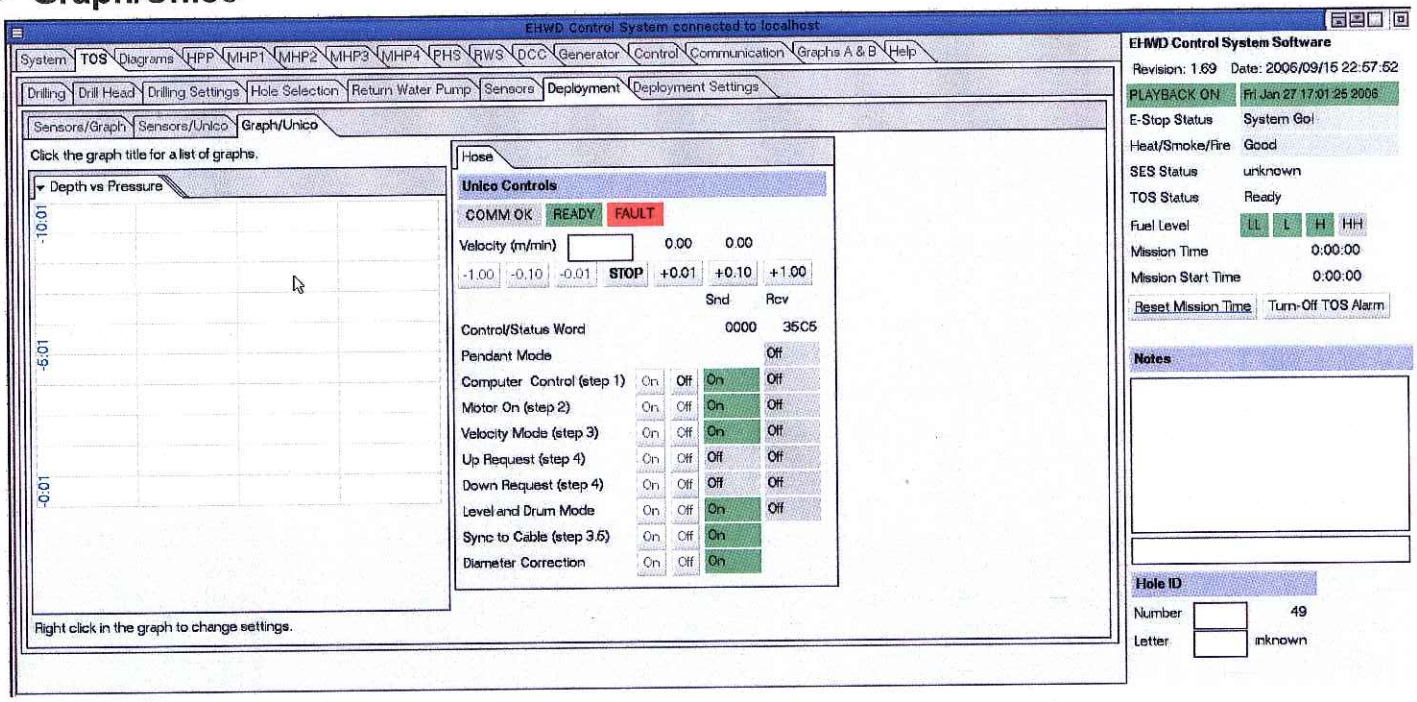
Screen Tab: TOS ▶ Deployment

▶ Sensors/Unico

This tab has the same data display as the main Sensors/Graph tab above, but instead of the graph window this tab has the controls for the Unico drive which controls the winch.



▶ Graph/Unico

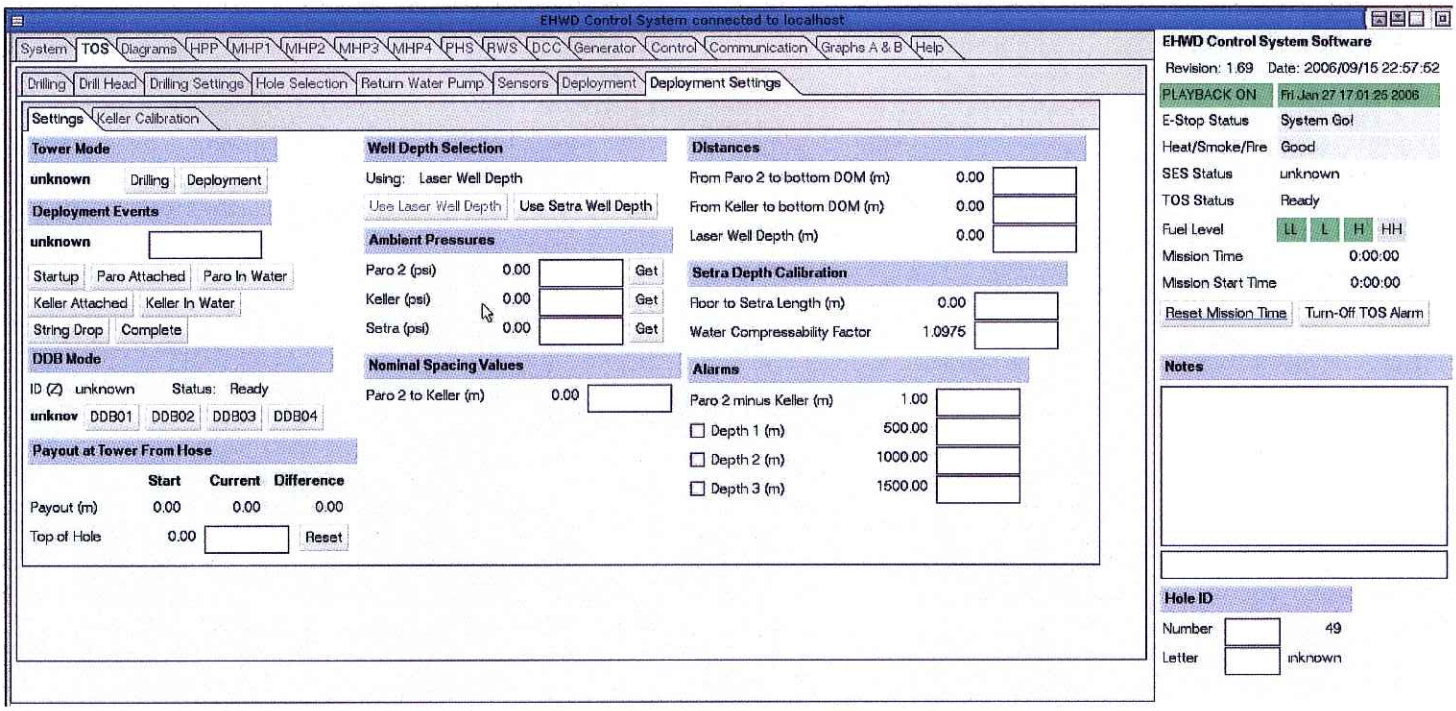


Screen Tab: TOS ► Deployment Settings

► Settings

This is the main tab for entering information that is needed for a correct depth calibration of the pressure data. Make sure you understand what all the entries mean before deployment starts.

Tower Mode	Click on "Deployment".
Deployment Events	Click the appropriate button when one of the predefined events occurs (see list below).
DDB Mode	Select the correct DDB ID before deployment startup (needed for Keller calibration).
Payout at Tower	Reset payout when bottom DOM is at tower floor level.
Well Depth Selection	Select source of well depth used in depth calculation.
Ambient Pressures	Press "Get" when pressure sensor is attached to cable, or enter reading at that time.
Nominal Spacing	Enter calculated distance between Paro and Keller.
Distances	Enter calculated distances between Paro/Keller and DOM60, and well depth.
Setra Depth Calib.	Enter measured length of Setra cable, from floor to sensor.
Alarms	Set values for which alarm is to be sounded (optional).



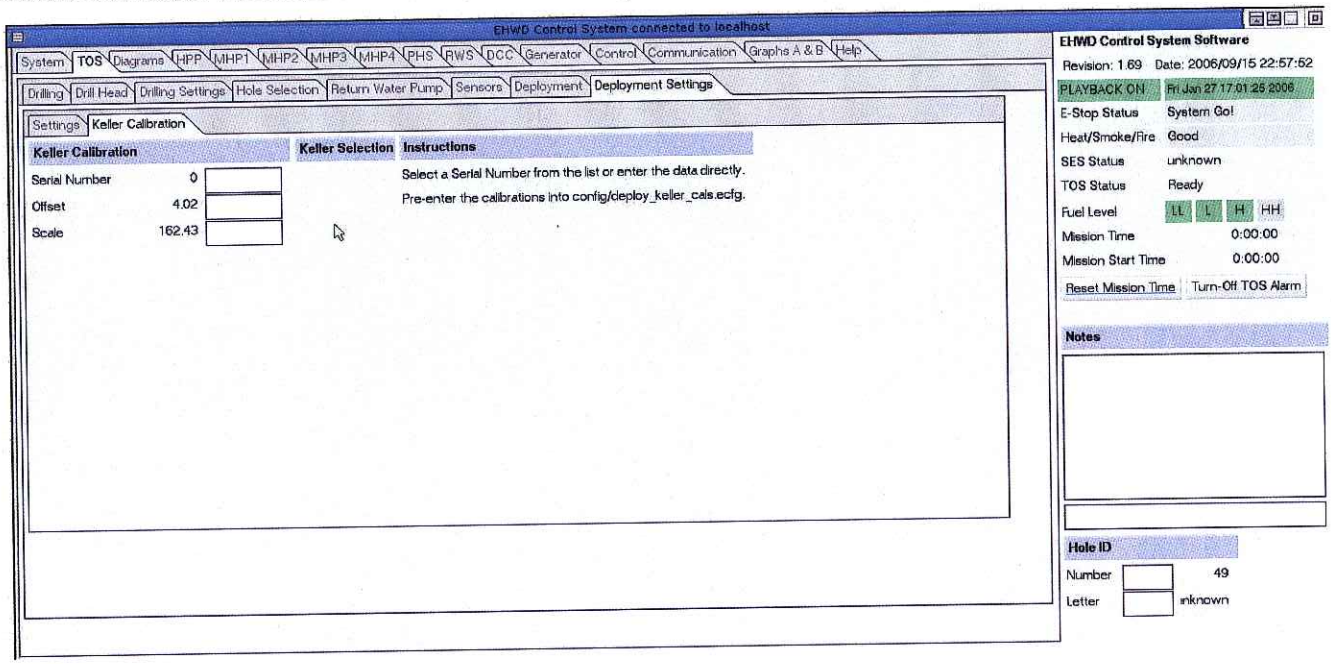
Deployment Events

☐ **Startup**	Click when the deployment begins.
☐ **Paro Attached**	Click when the Paro is attached to the breakout and starts sending data.
☐ **Paro In Water**	Click when the Paro reaches the water.
☐ **Keller Attached**	Click when the Keller is attached to the breakout and starts sending data.
☐ **Keller In Water**	Click when the Keller reaches the water.
☐ **String Drop**	Click when the String Drop phase begins, after all DOMs have been attached.
☐ **Complete**	Click when the deployment ends (string is secured, etc).

Screen Tab: TOS ▶ Deployment Settings

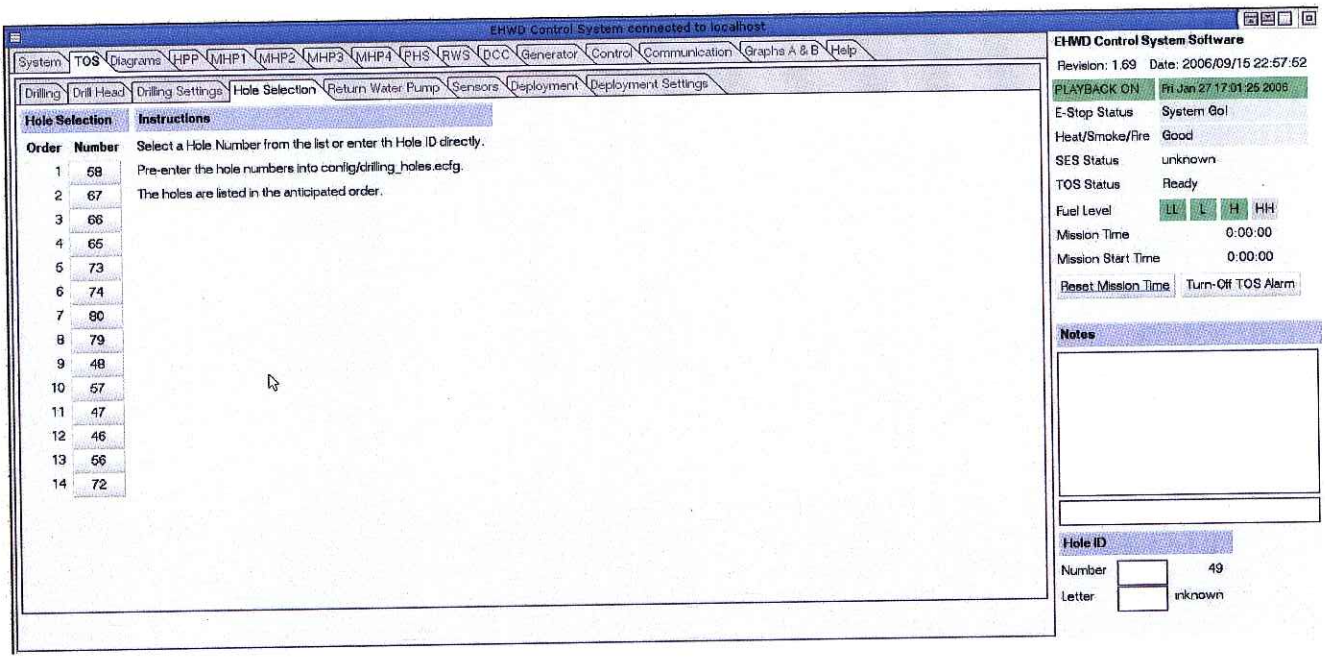
▶ Keller Calibration

On this tab you select the Keller ID by clicking on the appropriate button. The correct (pre-programmed) calibration constants will then be used for the Keller pressure reading.



Screen Tab: TOS ▶ Hole Selection

On this tab you select the hole/string number, *either* by clicking on the numbered button on the left *or* by entering it in the "Hole ID" field in the lower right hand corner.



Distances between devices

calculate manually and enter on Deployment Settings tab

Distance between Paro and DOM60: _____ = _____

Distance between Keller and DOM60: _____ = _____

Distance between Paro and Keller: _____ = _____

Notes:

There are 60 DOMs on every string.

The nominal spacing between DOMs is 17 m.

The nominal spacing between breakouts is 34 m.

Breakouts (1-30) and DOMs (1-60) are counted from the top.

The Keller is at breakout 15, just above DOM29.

The Paro is at breakout 30, just above DOM59.

(Fun Fact: There used to be a second Paro at breakout 1 on the first four strings)

Pressure conversions

	PSI	mH_2O	Atm
1 PSI =	1	0.70	0.07
1 mH_2O =	1.4	1	0.1
1 atm =	14.7	10.3	1

Check Sheet

STRING # 56?

DATE: _____

Before Deployment

- [x] **Action**: Locate laser ranger for well depth measurements.
- [ ] **Action**: Locate metric tape measure.
- [x] **Action**: Locate one Paro and one Keller, *plus spares* of each.
- [x] **Action**: Locate bucket (for cooling of Keller sensor with water/ice mix).
- [x] **Action**: Fill bucket with snow and place in heated area to make slush.
- [ ] **Action**: Locate Setra uphole pressure assembly (sensor + cable).

Deployment Startup

- [x] **Action**: Click "Deployment" button under "Tower Mode" on Deployment Settings tab.
- [x] **Action**: Select string (=hole) number on Hole Selection tab.
- [x] **Action**: Note deployment start time.

  Logbook: Time

- [x] **Action**: Click "Reset Mission Time" on the right panel on the deployment screen.
- [x] **Action**: Click "Startup" under Deployment Events.

☑ **Action**: Note DDB id number (1, 2, 3, or 4).

ENTER: DDB# (select button) 3

Logbook: DDB#

☑ **Action**: Take a well depth measurement with the laser ranger.

ENTER: Well depth [m] 52.598

Logbook: Well depth

☑ **Action**: Reset Payout when DOM60 breaks the plane of the floor.

CLICK: "Reset" button (Top of Hole Reset) on Deployment Settings ▶ Settings tab.

Logbook: Payout Start value 186.96 → 0

☐ **Action**: Get cable mark reading at DOM59.

Logbook: Cable mark [m] ?

☑ **Action**: Attach Paro at breakout #30. (This is called "Paro2" on the monitoring screen).

Logbook: Paro serial number

☑ **Action**: Click "Paro Attached" under Deployment Events.

☑ **Action**: Measure distance between Paro location and nearest DOM.

Estimate distance to *bottom* DOM by adding *n* 17-meter segments (*n* should be 1 for the Paro since nearest DOM is #59). .748 + 17.861 = 18.609

ENTER: Distance [m] from Paro to *bottom* DOM (#60)

Logbook: Distance to nearest DOM, nearest DOM#, estimated distance to DOM60

☐ **Action**: Get cable mark reading at Paro.

Logbook: Cable mark [m]

☑ **Action**: Take Paro air pressure reading just before it breaks the water surface.

ENTER: Ambient pressure [PSI] for Paro

Logbook: Paro2 air pressure 9.44

During Deployment

☑ **Action**: Click "Paro In Water" under Deployment Events.

☐ **Action**: Measure curved distance of main cable going around DOM (for at least two DOMs).

Logbook: Straight (vertical) distance for DOM segment, curved cable distance

☑ **Action**: Measure real distance between neighboring DOMs (for every pair) with laser ranger.

Logbook: DOM#'s, distance

☑ **Action**: Put Keller (and one spare) in bucket of water (at near freezing temperature) at least one hour before breakout #15 is reached.

Note: The Keller is not temperature corrected and must therefore be brought to the temperature of the water in the hole (0-2°C) before the air pressure offset is determined.

☑ **Action**: Attach Keller at breakout #15.

ENTER: Keller serial number

Logbook: Keller serial number

☑ **Action**: Click "Keller Attached" under Deployment Events.

☑ **Action**: Measure distance between Keller and nearest DOM.

Estimate distance to *bottom* DOM by adding *n* 17-meter segments (*n* should be 31 for Keller since nearest DOM is #29). .706 + 31×17 =

ENTER: Distance [m] from Keller to *bottom* DOM (#60)

Logbook: Distance to nearest DOM, nearest DOM#, estimated distance to DOM60

☐ **Action**: Get cable mark reading at Keller.

Logbook: Cable mark [m] for Keller

☑ **Action**: Determine Keller air pressure offset before (or just as) Keller hits water.

ENTER: Ambient pressure [PSI] for Keller

Logbook: Ambient Keller pressure

☑ **Action**: Click "Keller In Water" under Deployment Events.

☑ **Action**: Get cable mark reading at top DOM.

Logbook: Cable mark [m]

☐ **Action**: Measure well depth as soon as top DOM is under water.

ENTER: Well depth [m]

Logbook: Well depth [m], measurement method (laser/tape)

Between DOM attachment and String Drop

☐ **Action**: Lower Setra assembly into hole (after top DOM is at least 50 m under the surface).

☐ **Action**: Measure distance between Setra sensor and floor of tower (distance marked on cable).

ENTER: Distance Setra to floor [m]

Logbook: Distance Setra to floor

☐ **Action**: Measure well depth with Setra system and laser ranger and compare.

Logbook: Well depth from Setra [m], well depth from laser [m]

☐ **Action**: If the two well depth meaurements agree, switch from laser to Setra in monitoring system.

During String Drop

☑ **Action**: Click "String Drop" under Deployment Events.

☑ **Action**: Measure well depth manually (with laser ranger and/or tape measure).

(if shift lead allows: repeat several times during drop)

ENTER: Well depth [m]

Logbook: Well depth, measurement method (laser/tape)

☑ **Action**: Read cable marks at regular intervals.

Logbook: Cable mark [m]; depth readings [m] (Paro, Keller); time

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End of Deployment

☐ **Action**: Get final pressure readings from Paro and Keller when final depth has been reached.

Logbook: Pressure readings [PSI]; corrected depths [m] (from screen)

☐ **Action**: Get final well depth reading (laser and/or Setra).

HAS TO BE SIMULTANEOUS WITH FINAL PRESSURE READINGS!

Logbook: Well depth [m] (laser); well depth [m] (Setra)

☐ **Action**: Note deployment end time.

Logbook: Time

☐ **Action**: Click "Complete" under Deployment Events.