Work Plan

Aliso Canyon RCA: SS-25 Tubing and Wellhead Logistics

Prepared For:

SS-25 RCA
CPUC, DOGGR

Purpose:
Define the Work Plan for moving the 2-7/8" tubing and wellhead equipment from Aliso Canyon to Houston, Texas.

Version:	**Date:**
5	**18th October 2017**

Project Number:
SCG-16-001

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Version Record

Version No.	Issue Date	Issued As / Nature of Revision	Author	Checked By	Project
1	July 7, 2017	Final	RLR	WSW, NA, RMK, SK	RMK
2	July 14th, 2017	Final	RMK	WSW, NA, SK, RLR	RMK
3	July 31st, 2017	Final	RMK	WSW, NA, SK, RLR	RMK
4	October 15th, 2017	Final	RMK	RLR, RM, BW	RMK
5	October 18th, 2017	Final	RMK	RLR, NA, BW	RMK

Revision History

Revision	Date	Description of Change
2	July 14th, 2017	Item 1 in Section 2
3	July 31st, 2017	Introductory statements in Section 1
4	October 15th 2017	Put specific references to the trucking and the security company
5	October 18th, 2017	Minor edits

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1 Background

Blade is in the process of conducting a Root Cause Analysis (RCA) of the October 2015 gas leak in the Southern California Gas Co. Aliso Canyon gas storage field located near Porter Ranch, California. Blade has provisional authority as granted by the CPUC to conduct a Root Cause Analysis (RCA) on well SS-25. The Blade Team and the parties under Blade's direction are responsible for transporting the tubing and wellhead to Houston. The person in charge (PIC) of the RCA is the Blade Team Lead, Ravi Krishnamurthy. Should clarification be required or disagreements arise CPUC, DOGGR and Blade shall meet and attempt to agree on steps going forward. If the entities are unable to agree on any activities described for tubulars handling for SS-25, Blade will document such differences and the designated regulatory agency will act as the arbiter, and make the final decision.

Blade reserves the right to deviate from these procedures as unique situations arise. Furthermore, the Blade team shall document any significant deviation from these procedures that may affect the ability to collect data and evidence for RCA purposes, and will notify the CPUC and DOGGR. Blade shall obtain appropriate approvals from CPUC and DOGGR in advance of subsequent activity, however, should agreement not be reached, Blade will document such differences and the designated regulatory agency will act as the arbiter, and make the final decision.

244 joints of 2-7/8" tubing were extracted from Well SS-25. After extraction, the tubing was cleaned, inspected and prepared for transport and loaded in bolsters for shipping to Houston, Texas.

All steps for extraction through preparation for shipping are covered by the following protocol documents that have been previously issued.

SS-25 Phase 3 Tubing, Casing, Wellhead Extraction Protocol, Version 6 (or latest version)

Phase 3 – Wellsite Tubulars Handling Protocol, Version 4 (or latest version)

The following are details for the shipment of 2-7/8" tubing bolsters.

1. Average joint length of 31' based on actual measurements taken during the extraction process.
2. Bolster weight maximum of 8,000 lbs based on crane limitations in the Houston warehouse
3. 244 joints of tubing from SS25 will be shipped.
4. In addition to the 244 joints from Well SS-25; an additional 4 joints of non-SS-25 tubing will be shipped to be used as test joints in the inspection process
5. Total of 7 bolsters will be shipped. Bolster details in Appendix A.
6. Each bolster is 31.5" wide x 29.0" high and approximately 32' length (2.63' wide x 2.41' high x 32' length)
7. Two trucks will haul the 7 bolsters.
8. 3 tubing joints required special handling, and were packaged separately in a crate.
9. Wellhead components will be transported in 12 crates.

10. In total, there are two wooden enclosures that will encompass 244 bolstered joints. In addition there will be 12 crates containing wellhead sections and one crate containing three tubing joints. All wood enclosures and crates will have tamper-evident tape.

2 Logistics Details

The following steps define the logistics process for tubing transportation from Aliso Canyon to the Aliso Canyon SS-25 Root Cause Analyses Storage facility in Houston Texas. Should any accident or anomaly occur during transport, the CPUC should be notified immediately by calling Kenneth Bruno (415) 852-2936 or Elizaveta Malashenko at (415) 792-3263

1. Doby Hagar Trucking Inc., will transport the tubing and wellhead equipment to Houston. There will be two trucks.
2. Pinkerton will be the third party security escort. The purpose of the security escort is to observe / witness and ensure secure tubing transportation to Houston. The security escort will include two teams of two armed guards that will travel with the trucks.
3. All 7 bolsters will be loaded at Aliso Canyon and all 7 bolsters will travel together in a convoy to Houston. The bolster details are summarized in Appendix A. All wellhead equipment will be transported together with the tubing. The wellhead and three tubing joints are being transported in crates. The details on the wellhead crates are provided in Appendix B. Two trucks will be necessary to transport the tubing and wellhead.
4. The tubing bolsters are within protective wooden enclosures. Wellhead components are contained in wooden crates. Three tubing joints are also contained in a wooden crate. There are tie-down straps holding the wooden enclosures in place. The locking mechanism for these straps will be sealed with numbered Blade zip ties, which will be used to identify tampering during transportation. Additionally, all wood enclosures and crates will have tamper-evident tape.
5. A Chain of Custody (COC) document that was prepared per “AC-RCA Phase 3 Tubulars Handling Protocol Rev 004, 31-July-2017” will be used to track the tubulars during transportation. There is a COC form for every tubing joint and wellhead component. COC will be signed by Blade personnel at Aliso Canyon PS20, and custody will be transferred to Doby Hagar Trucking. The COC documents will travel in the truck with the tubing. A copy of the driver’s license for all the truck drivers will be retained by Blade.
6. There will be a video recording of the crated load on the truck through the entire transportation process. The security escort will also have a camera that is recording the entire transportation process. The security escort will log all events throughout the trip and will provide it to Blade in Houston.
7. The convoy will travel straight through, stopping only for fuel and meals with 2 drivers per vehicle. At every stop, the loads, Blade zip ties and tamper-evident tape will be visually assessed by Pinkerton security and ensure no tampering. All these stops, inspections and any other events along the drive to Houston will be part of the Pinkerton Security report. Doby Hagar Trucking may require removal of the Blade zip ties to further tighten the wooden enclosure tie-down straps. The security escort will retain and preserve the removed Blade zip ties then install replacement Blade zip ties; such events will be logged by Pinkerton. Any removal of tamper-evident tape due to wind loads will be documented by Pinkerton.
8. When the convoy nears the Houston area, contact will be made with Blade Energy Partners to arrange for Blade to receive the tubing and wellhead equipment.

9. Doby Hagar Trucking will relinquish the tubing and wellhead over to Blade per the COC process. The trucks will back into the storage facility. The Blade zip ties and tamper-evident tape will be inspected for breach of seal. The wood enclosures will be dismantled and a crane will offload the bolsters. Crane operators and slings for offloading will be provided by Blade. On receipt of the tubing crates in Houston, a visual inspection of the bolstered tubing will be conducted to confirm lack of damage and tampering. The Pinkerton report will be reviewed to verify their visual inspection during transportation. Finally, the video recording of the tubing transportation from Doby and Pinkerton will be obtained by Blade. Copies of this recording and all the reports by Doby and Pinkerton will be sent to CPUC and DOGGR investigative teams.
10. Once the trucks are offloaded and the paperwork is completed the Doby Hagar trucks and Pinkerton will be released.

2.1 Aliso Canyon SS-25 Root Cause Analyses Storage Facility

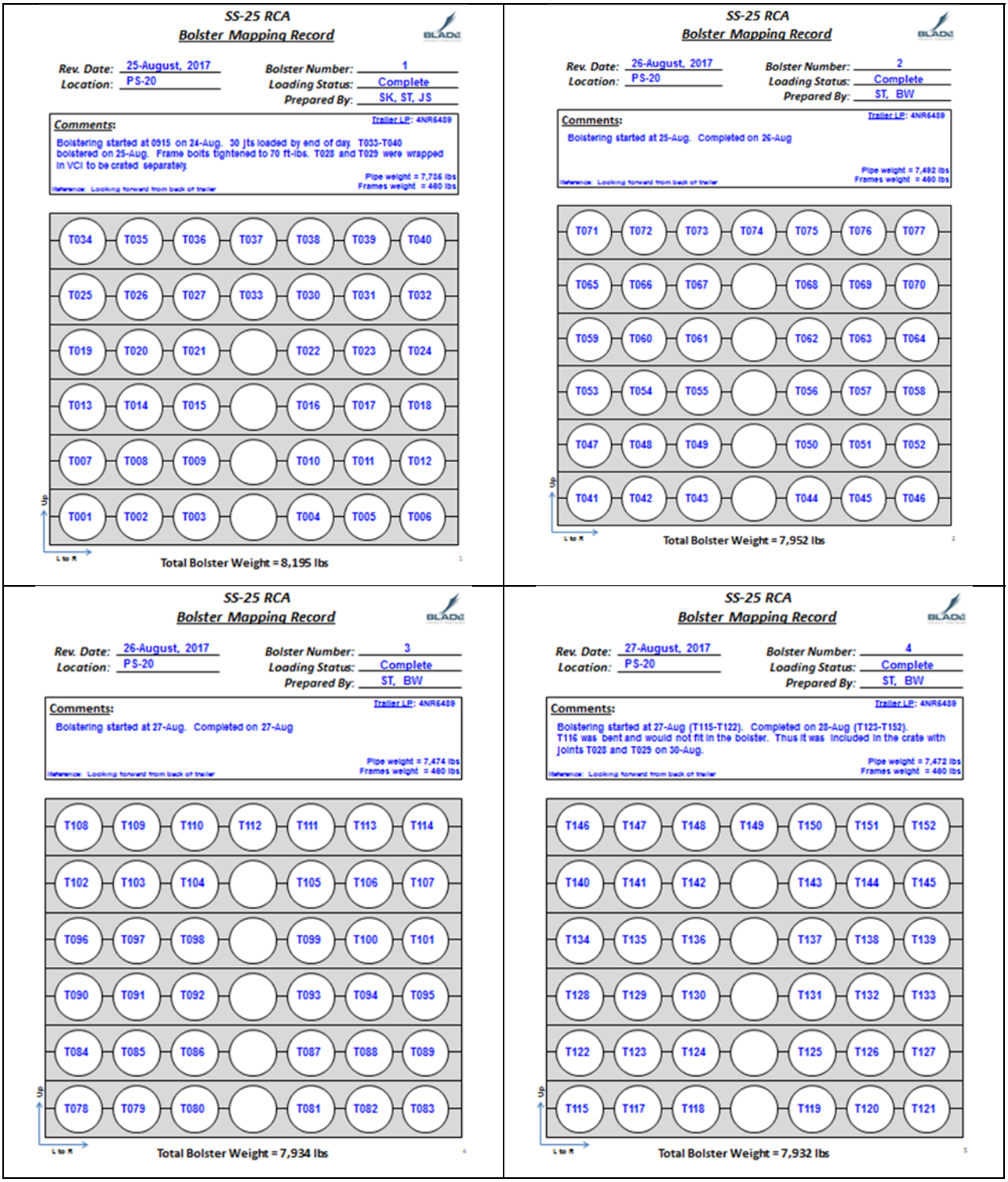
5504 Clara Road; Houston, Texas 77041

2.2 Blade Contacts in Houston for Receiving and Offloading

Prior to arriving in Houston, contact Blade and make arrangements to meet at the warehouse for Blade to receive the tubing and offload the trucks.

Ravi Krishnamurthy Mobile Tel 832.309.6087

3 Appendix A: Tubing Bolster Maps



SS-25 RCA
Bolster Mapping Record

Rev. Date: 25-August, 2017
Location: PS-20
Bolster Number: 1
Loading Status: Complete
Prepared By: SK, ST, JS

Comments:
Trailer LP: 4NR6489
Bolstering started at 0515 on 24-Aug. 30 jts loaded by end of day. T033-T040 bolstered on 25-Aug. Frame bolts tightened to 70 ft-lbs. T028 and T029 were wrapped in VCI to be crated separately.
Pipe weight = 7,736 lbs
Frames weight = 480 lbs
Reference: Looking forward from back of trailer

T034	T035	T036	T037	T038	T039	T040
T025	T026	T027	T033	T030	T031	T032
T019	T020	T021		T022	T023	T024
T013	T014	T015		T016	T017	T018
T007	T008	T009		T010	T011	T012
T001	T002	T003		T004	T005	T006

Up
L to R

Total Bolster Weight = 8,195 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 26-August, 2017
Location: PS-20
Bolster Number: 2
Loading Status: Complete
Prepared By: ST, BW

Comments:
Trailer LP: 4NR6489
Bolstering started at 25-Aug. Completed on 26-Aug
Pipe weight = 7,492 lbs
Frames weight = 480 lbs
Reference: Looking forward from back of trailer

T071	T072	T073	T074	T075	T076	T077
T065	T066	T067		T068	T069	T070
T059	T060	T061		T062	T063	T064
T053	T054	T055		T056	T057	T058
T047	T048	T049		T050	T051	T052
T041	T042	T043		T044	T045	T046

Up
L to R

Total Bolster Weight = 7,952 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 26-August, 2017
Location: PS-20
Bolster Number: 3
Loading Status: Complete
Prepared By: ST, BW

Comments:
Trailer LP: 4NR6489
Bolstering started at 27-Aug. Completed on 27-Aug
Pipe weight = 7,474 lbs
Frames weight = 480 lbs
Reference: Looking forward from back of trailer

T108	T109	T110	T112	T111	T113	T114
T102	T103	T104		T105	T106	T107
T096	T097	T098		T099	T100	T101
T090	T091	T092		T093	T094	T095
T084	T085	T086		T087	T088	T089
T078	T079	T080		T081	T082	T083

Up
L to R

Total Bolster Weight = 7,934 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 27-August, 2017
Location: PS-20
Bolster Number: 4
Loading Status: Complete
Prepared By: ST, BW

Comments:
Trailer LP: 4NR6489
Bolstering started at 27-Aug (T115-T122). Completed on 28-Aug (T123-T152). T116 was bent and would not fit in the bolster. Thus it was included in the crate with joints T028 and T029 on 30-Aug.
Pipe weight = 7,472 lbs
Frames weight = 480 lbs
Reference: Looking forward from back of trailer

T146	T147	T148	T149	T150	T151	T152
T140	T141	T142		T143	T144	T145
T134	T135	T136		T137	T138	T139
T128	T129	T130		T131	T132	T133
T122	T123	T124		T125	T126	T127
T115	T117	T118		T119	T120	T121

Up
L to R

Total Bolster Weight = 7,932 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 29-August, 2017
Location: PS-20
Bolster Number: 5
Loading Status: Complete
Prepared By: ST, BW

Trailer LP: 4NC1414

Comments:
Bolstering started at 29-Aug (T153-T182). Completed on 29-Aug (T183-T188)

Pipe weight = 7,196 lbs
Frames weight = 480 lbs

Reference: Looking forward from back of trailer

T183	T184	T185		T186	T187	T188
T177	T178	T179		T180	T181	T182
T171	T172	T173		T174	T175	T176
T165	T166	T167		T168	T169	T170
T159	T160	T161		T162	T163	T164
T153	T154	T155		T156	T157	T158

Up
L to R

Total Bolster Weight = 7,655 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 2-September, 2017
Location: PS-20
Bolster Number: 6
Loading Status: Complete
Prepared By: RM, BW

Trailer LP: 4NC1414

Comments:
Bolstering started at 29-Aug (T189-T209). Completed on 2-Sept (T210-T218)

Pipe weight = 8,008 lbs
Frames weight = 480 lbs

Reference: Looking forward from back of trailer

T212	T213	T214	T215	T216	T217	T218
T208		T209		T210		T211
T204		T205		T206		T207
T200		T201		T202		T203
T196		T197		T198		T199
T189	T190	T191	T192	T193	T194	T195

Up
L to R

Total Bolster Weight = 6,469 lbs

SS-25 RCA
Bolster Mapping Record

Rev. Date: 2-September, 2017
Location: PS-20
Bolster Number: 7
Loading Status: Complete
Prepared By: RM, BW

Trailer LP: 4NC1414

Comments:
Bolstering completed on 2-Sept. Joints X500 to X800 are extra joints to be used by the inspection company for parameter testing prior to UT'ing the tubing, and did not come from the SS-25 well.

Pipe weight = 6,906 lbs
Frames weight = 480 lbs

Reference: Looking forward from back of trailer

T243	T244	X500		X600	X700	X800
T239		T240		T241		T242
T235		T236		T237		T238
T231		T232		T233		T234
T226	T217		T228		T229	T230
T219	T220	T221	T222	T223	T224	T225

Up
L to R

Total Bolster Weight = 6,365 lbs

All joints are bolstered aside from 3 joints, namely T028, T029, and T116 and are crated per pictures above.

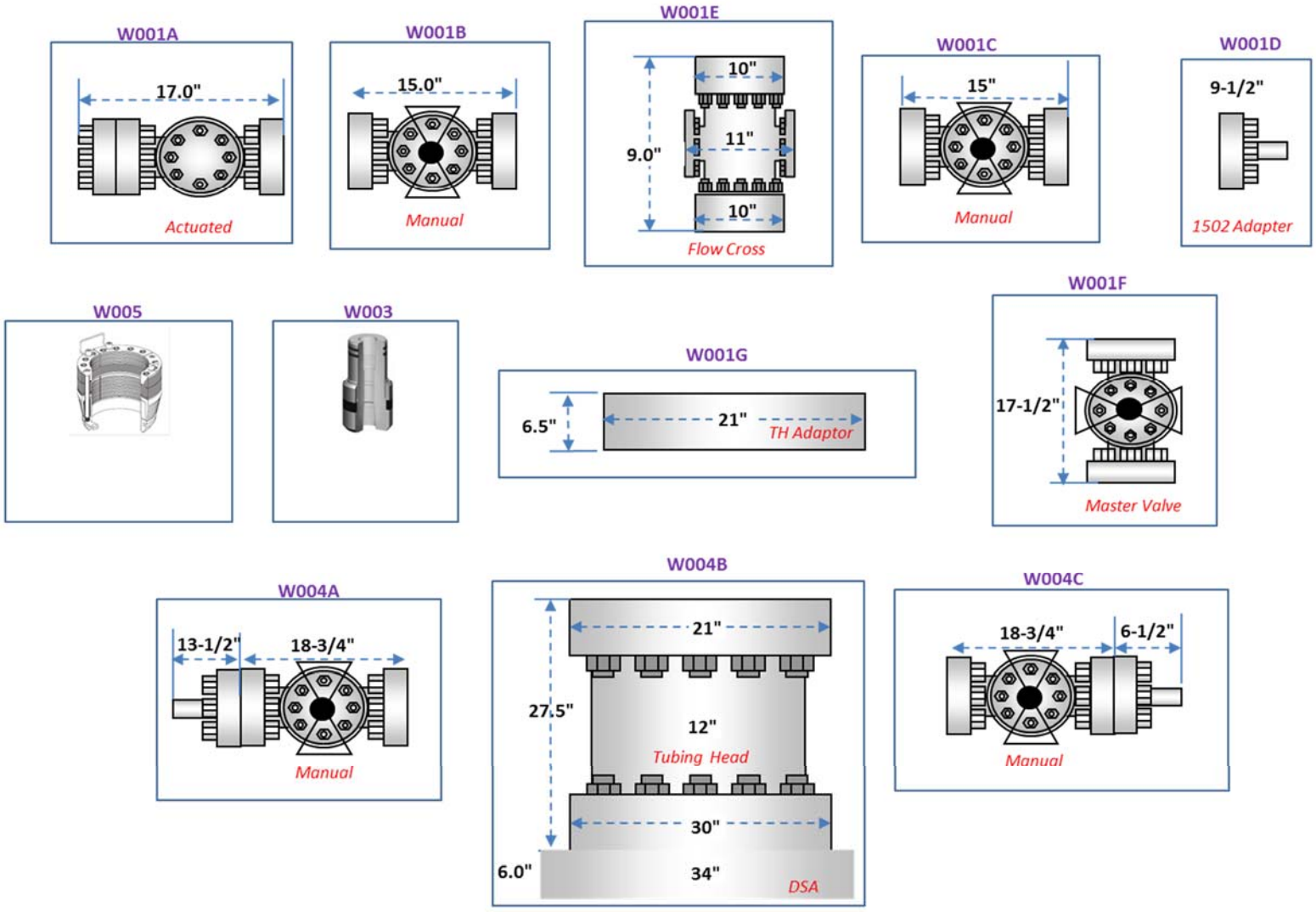
4 APPENDIX B WELLHEAD CRATE DETAILS

4.1 Wellhead Crating Inventory

The inventory of the individual wellhead crates are shown below.

Number	Crate Label	Contents
1	W001A	W001A – Actuated Valve
2	W001B	W001B – Manual Valve
3	W001C	W001C – Manual Valve
4	W001D	W001D – 1502 Adapter
5	W001E	W001E – Flow Cross
6	W001F	W001F – Master Valve
7	W001G, W002	W001G - Tubing Head Adapter, W002 – Studs and Nuts
8	W003	W003 – Tubing Hanger
9	W004A	W004A – Tubing Head Wing Valve
10	W004B	W004B Tubing Head and Double Studded Adapter
11	W004C	W004C – Tubing Head Wing Valve
12	W005	W005 – Casing Slips and Seal Assembly

Along with the details of the wellhead components, the process of crating is shown below.



Tree and Wellhead Labelling

Disassembled
Cleaned
Inspected
Coated Internally

Placed on mylar bag

VCI pad enclosed
Vaccum packed
Heat sealed

Crate assembled, secured and logged into evidence trailer

Crating Process