Aviation Safety Council
Taipei, Taiwan

GE791 Accident Investigation

Factual Data Collection

Group Report

Recovery Group

October 28, 2003

ASC-GRP-03-10-001

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II. History of Activities

Date	Description
12/21/2003	ASC was notified at 0200. Recovery group arrived Makung Airport at 0800. ASC Command Post was set up adjacent to the Emergency Response Center. The search data collection began.
01/09/2003	Ocean Hercules of the SMIT Salvage Company arrived at Kaohsiung harbor in the morning. After customs clearance and logistic support provided, the vessel headed to accident site.
01/10/2003	Ocean Hercules stood by at Makung harbor in early morning. ASC and Tran Asia personnel with the help from coast guard transport embarked at 0900 and began to work.
01/10/2003	Under rough sea conditions, the Ocean Hercules still headed toward site attempting underwater recovery operation. However, strong winds and high waves stopped ROV operation. At 1600 wind died down ROV operation began and completed operation at NP-1,NP-2,NP-3,NP-5,NP-6 （Figure 1.18-21）,only small pieces of wreckage at NP-1 were located.
01/11/2003	Early morning, ROV filming operation began at eight locations given by the Navy. Tiny pieces of wreckage were discovered at NP1, nothing else at other locations. At 0900 rough sea condition stopped ROV operation. Hence, switched to underwater sonar scanning. Using target points provided by Ocean Research II (OR-II) as basis, after 12 hour trying several target pointswere scaned. The wreckage spread area is similar to the OR-II target point's area. When the current calms again, ROV sonar were deployed to scan two areas of 350m^2.
01/12/2003	At 0626, ROV discovered FDR fore part and pinger. At 0800 ROV mechanical arm salvaged FDR, and subsequently discovered wreckages such as: Brake disk, Engine mounting, Engine casing, Landing gear#2, Large engine part, Generator, etc.. Work continued until 1630 when ocean current got strong. The FDR was delivered to ASC Lab by IIC.
01/13/2003	At 1740, ROV discovered CVR fore part without pinger. At 1900 the ROV mechanical arm salvaged CVR.
01/14/2003	The CVR was delivered to to to ASC Lab.

01/14/2003~ 01/24/2003	Ocean Hercules began seabed sweeping and searching based on coordinates scanned by OR-II, no discovery.
12/21/2003~ 01/24/2003	Ocean Hercules salvaged landing gear and engine propeller wreckages.
01/24/2003	At 1200 Ocean Hercules terminated salvage operation. Wreckage on deck was ferried to shore by coast guard boats, then ground transportation was used to ship the wreckage to the Air Force Base in Makung.
02/18/2003~ 03/14/2003	Fishing boat-trawling operation picked up 102 pieces of wreckage. A total of 199 wreckage pieces was recovered.

1.18.7 Wreckage Recovery

1.18.7.1 Wreckage distribution

After the accident occurred, the Coast Guard launched the search and rescue operation and several fishing boats joined the operation as well. The Coast Guard found floating wreckages around 119.26E, 23.25N, 119.35E, 24.55N and 119.26E, 23.25N. The Navy searching vessels used the side scan sonar and acoustic receiver to detect the wreckage and one of the flight recorders. The area of suspected targets detected by Navy shows in Figure 1.18-10 with blue circle. The suspected targets detected by Ocean Research II (OR-II) side scan sonar shows in 1.18-10 with green circle. With these targets, the Ocean Hercules double checked the targets with its video camera that was mounted on remote operating vehicle (ROV). Those wreckage found in area of latitudes from 119°26'16"E to 119°26'23"E , longitudes from 23°28'38"N to 23°28'47"N about 60 meters of water depth shows in Figure 1.18-10 red circle. The debris field distributed in an area of about 170 meters x 280 meters (see Figure 1.18-11). The Figure also shows the most dense area of wreckage in red circle. Wreckage such as power plants, landing gears and wing tanks were found in this area. Both flight recorders were found in this area as well. The densest distribution of wreckage shows in Figure 1.18-12. Figure 1.18-11 shows the less dense area was between red line and orange line. Small debris and less dense area were between orange line and blue lines.

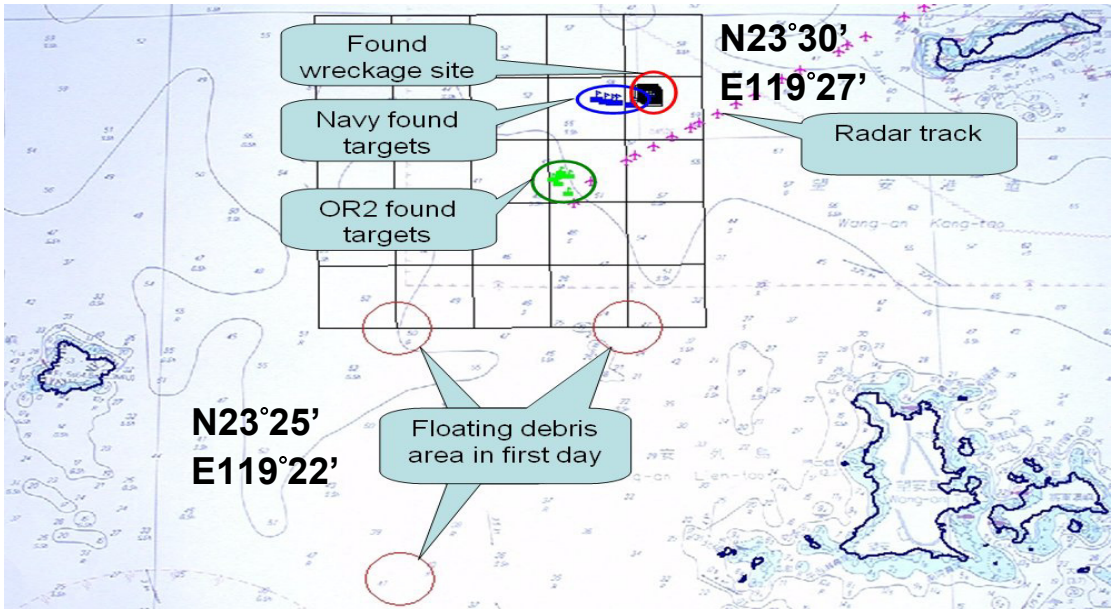

Figure 1.18-10 shows the floating wreckage distribution, suspected targets areas and radar track.

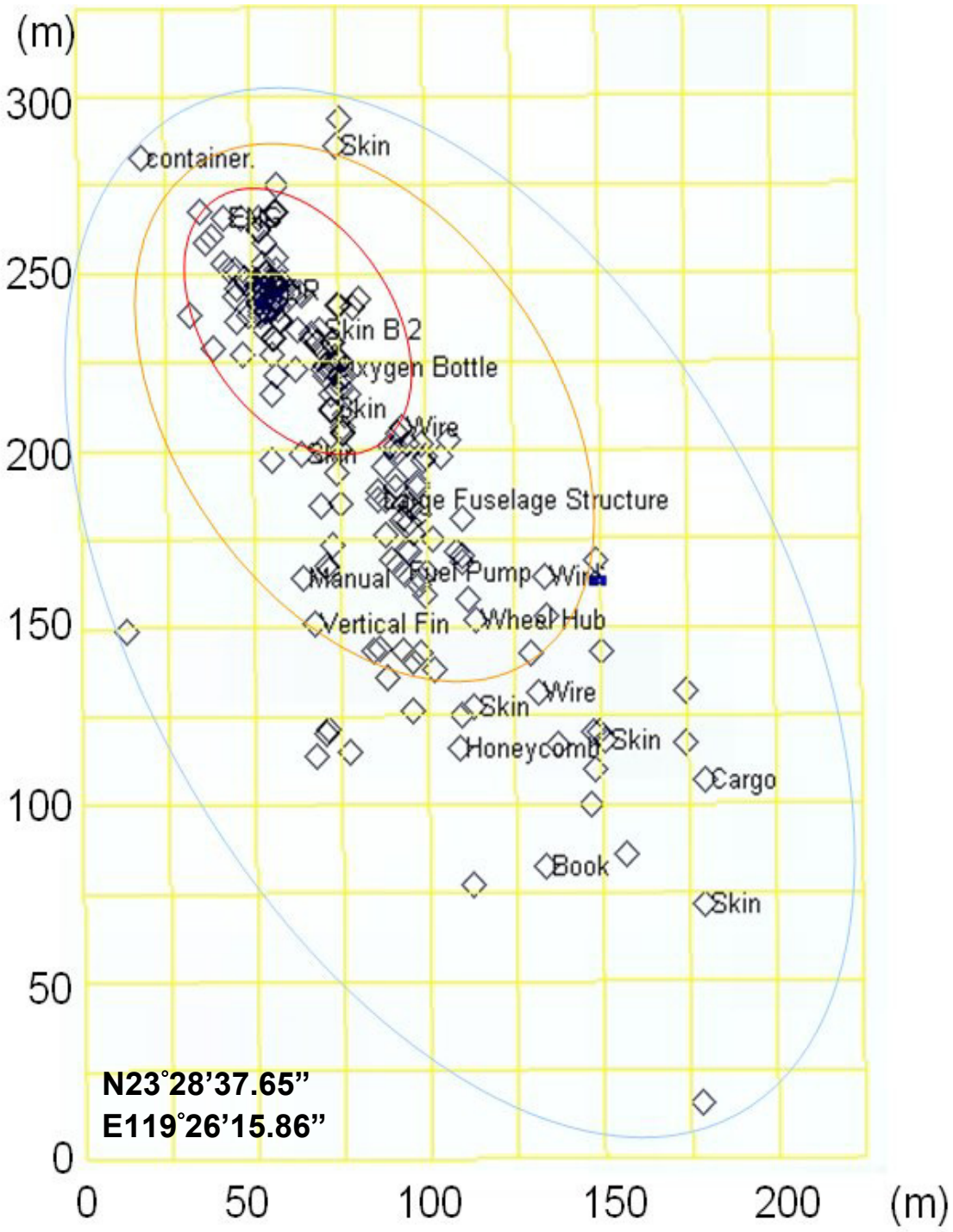

Figure1.18-11 wreckage distribution pattern

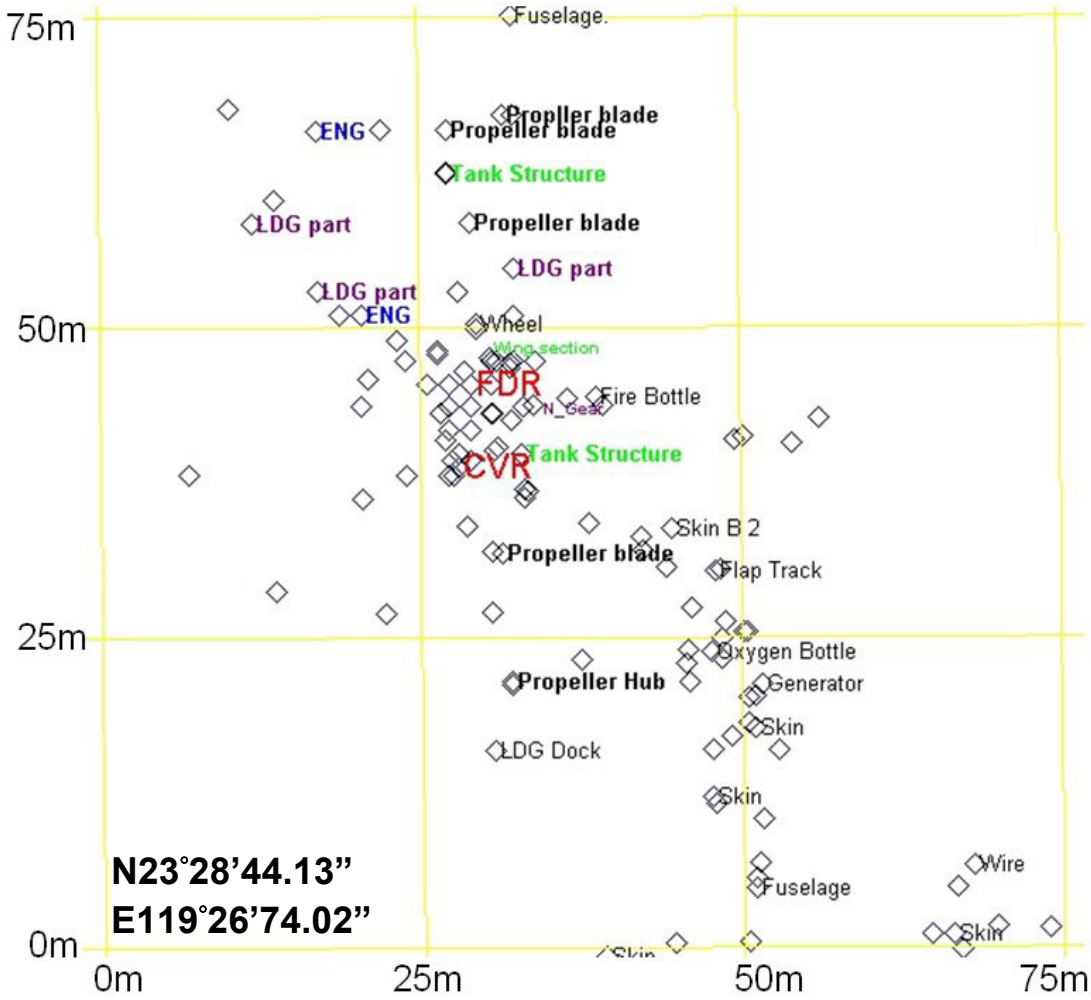

Figure1.18-12 wreckage distribution in dense area

1.18.7.2 Site survey and radar track

After finding the main wreckage site, Recovery Group measured the distance between the last transponder data position at the first calculated radar track and other found targets（see the purple track in Figure1.18-10）which was the reference point for site survey planning. For more precise calculation of the track, Recovery Group considered the local oval globe effect and re-calculated the track (see red track in Figure1.18-13). The distance between the last radar position and main wreckage site was about 186 meters.

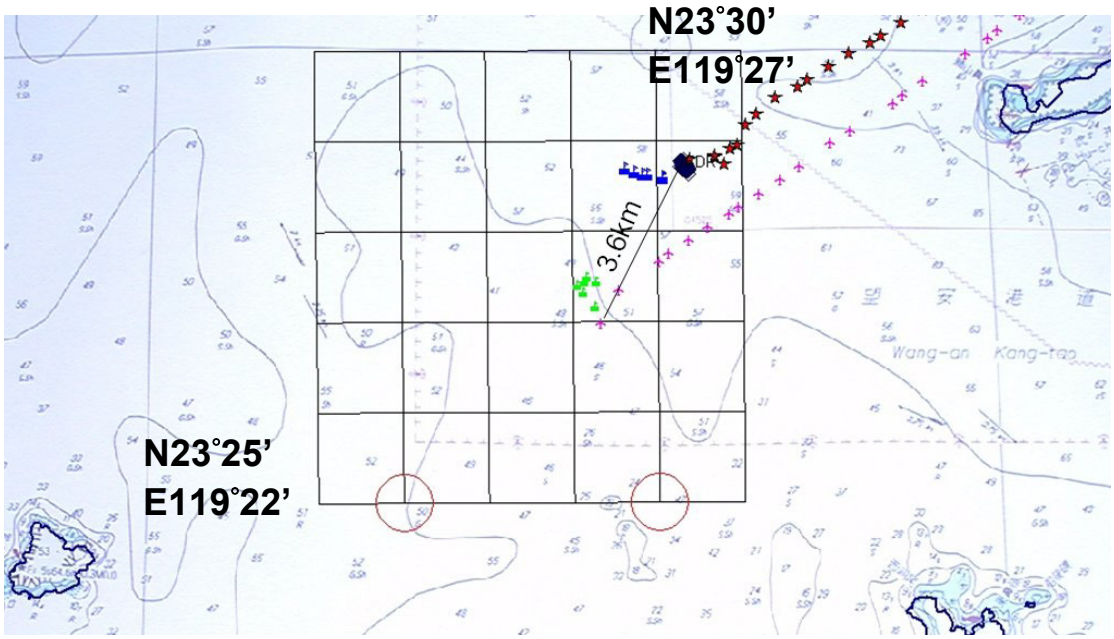

Figure 1.18-13 Comparison between radar tracks and main wreckage site

Floating wreckage: The floating wreckages found by Navy and Coast Guard was 87 pieces. Most of them are honeycomb of wing trailing edge, flaps, rudder, and elevators engine cowling and so on (refer to Figure 1.18-14). Some of them are clothing. The biggest one was number 55, which was a roll of clothing (210 cm X 17 cm). The smallest one is a taco meter of engine rpm (10cmX1cm)

Figure 1.18-14 Floating wreckages

Underwater wreckage：The Ocean Hercules recovered 10 pieces of wreckage and trawling operation recovered 102 pieces. Most of them are from of wing structure, fuselage skin, landing gears, wheel, stringer and frame (refer to Figure 1.18-15). The biggest piece is a cargo floor (no.198 with size

of 205cmX135cmX6cm). The smallest one was fuselage skin (no.152 with size 24cmX8cmX0.2cm).

Figure 1.18-15 Underwater wreckagerecovered by trawling operation

1.18.7.3 Search Operation

On the second day of the GE791 accident, ASC began the wreckage search operation.

Search team included the Navy, Coast Guards, Chung-Shan Institute of Science and Technology (CSIST), National Science Council (NSC) and Ocean Hercules of SMIT Salvage Company (see Figure 1.18-16~19). The search team would gauge weather condition, then hold coordination meetings to work out a search and salvage plan.

Figure 1.18-16 Underwater search and survey team _Navy

Figure 1.18-17 Underwater search and survey team _Coast Guard

Figure 1.18-18 Underwater search and survey team _Ocean Research II

Figure 1.18-19 Salvage vessel _Ocean Hercules ROV

Search Plan

The search plan maps out search areas with reference to the location where GE791's radar target disappeared from radarscope. The plan also covers areas where the Coast Guards found floating wreckages and the aerial search team found oil patches. Then the course of current, seabed terrain, possible flight path and speed as the aircraft hit water, wind direction and speed were considered. Lastly, capabilities of the vessels and their search / salvage devices were taken into account to designate their search areas (Figure 1.18-20). A preliminary area of 25 km^2 was planned.

At the beginning of search operation, the Navy called regular meetings for reporting search results of the day, weather forecast and plans for the next operation. Representatives from the ASC, Defense Command, Navy, Tran Asia Airways, Coast Guard and Makung Airport were invited by Navy. ASC provided radar data and sketch of the salvage operation region for Navy's reference, the Navy then deployed the vessels to conduct surface and underwater search operation accordingly.

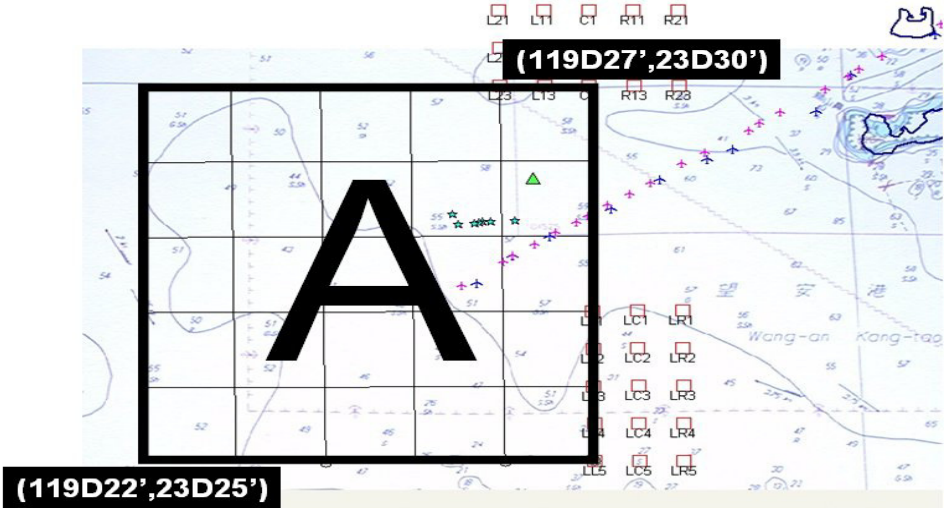

Figure 1.18-20 Initial search and survey area

Search Operation Units

The navel ship has sonar search and sound perceiving device, and began operation soon after the negotiation meeting. The Coast Guard on the other hand, teamed with ASC and CSIST in the operation (Figure 1.18-21~22). The NSC vessel Ocean Research II mainly used sonar side scan to conduct wide range search operation, while SMIT Ocean Hercules conducted underwater filming to confirm target objects. Details of operation units as follows: mode

Operation Units	Period	Form
Navel Ship Unit I	2002/12/21~2003/01/09	Underwater sound perceiving
Navel Ship Unit II	2002/12/21~2003/01/09	Sonar scan
ASC & Coast Guard	2002/12/21~2003/01/09	Underwater sound perceiving
CSIST & Coast Guard	2003/01/05~2003/01/11	Underwater sound perceiving
NSC Ocean Research II	2003/01/05~2003/01/13	Sonar side scan
SMIT Ocean Hercules	2003/01/10~2003/01/22	Sonar side scan, ROV filming

Figure 1.18-21 Search flight recorders with pinger receiver

Figure 1.18-22 CSIST engineers searched flight recorders at Coast Guard boat.

Search Result

During operation period, the Navy perceived signals at two sites suspected to be the flight recorders underwater pinger, and also found target objects at eight sites seemed to be wreckages. ASC, CSIST and the Coast Guard confirmed the pinger signal at one site, but could not confirm the signal at the second site (Figure 1.18-23~25). The Navy also assisted ASC in using triangle-positioning method to lock position of the source of recorders signal.

Suspected wreckage position and recorders underwater pinger positions as follows:

Figure 1.18-23 Flight recorders searching_BEA safety investigator

Figure 1.18-24 Flight recorders searching_ASC investigator(1)

Figure 1.18-25 Flight recorders searching_ASC investigator(2)

Table 1:18-3 Targets found by Navy

Item	Description	Dim.(mxm)	Lattitude	Longtifude
NP-1	Many wreckage scattered	8x5	23D28.716’	119D26.352
NP-2	Big metal reflection	9x5	23D28.582	119D26.07
NP-3	3 segments	10x4	23D28.644	119D25.733
NP-4	Protruded into seabed 15 degree	7x2	23D28.683	119D25.626
NP-5	Impact position on seabed	8x6	23D28.592	119D26.067
NP-6	Marks caused by undertwater spot impacted	15.9x10.3	23D28.617	119D25.883
NP-7	Unknow	7.5x6	23D28.624	119D25.826
BB-1	Suspected targets 1 flight recorders		23D28.298	119D25.449
BB-2	suspected target 2		23D28.77	119D26.33

Table1.18-4: Targets found by Ocean Research II

Target	Priority	Dem.(m x m) .	Latitude	Longtitude
A	2	5x2 4x3, 4x3, 4x2, + F	23D28.757	119D26.299
B	2	6x2, 3x1	23D28.743	119D26.325
C1	2	5x2, 6x1, + F + 5x3 (50m to N)	23D28.417	119D26.203

C	2	5x1, 3x3 + F	23D28.764	119D26.292
D	1	4x3	23D28.466	119D26.202
E	1	5x2, 4x1	27.997	119D26.113
F	1	4x1, 3x2	23D28.459	119D26.202
G	2	10x4, 10x1, 7x2, 5x2, 5x1	23D28.455	119D26.007
H	2	4x2, 3x3	23D28.570	119D26.006
I	1	5x4, 5x3	23D28.467	119D26.007
J	2	11x3 + F	23D28.307	119D25.848
K	2	6x3, 5x1	23D28.453	119D25.957
L	2	4x2 +F	23D28.328	119D25.915
M	1	8x3	23D28.600	119D25.823
N	2	9x5	23D28.457	119D25.820
O	2	5x1, 3x2	23D28.404	119D25.748
P	2	6x1	23D28.261	119D25.682

1.18.7.3 Salvage Operation

On January 9th, 2003 SMIT Ocean Hercules arrived at Kaoshiung harbor for customs clearance and supply, then sailed for the accident site at Penghu waters. In early morning on January 10th, 2003 the vessel was on stand by at Makung out port, and at 0900 ASC and Transasia staff were ferried by the Coast Guard to the Ocean Hercules, to begin operation (Figure 1.18-26).

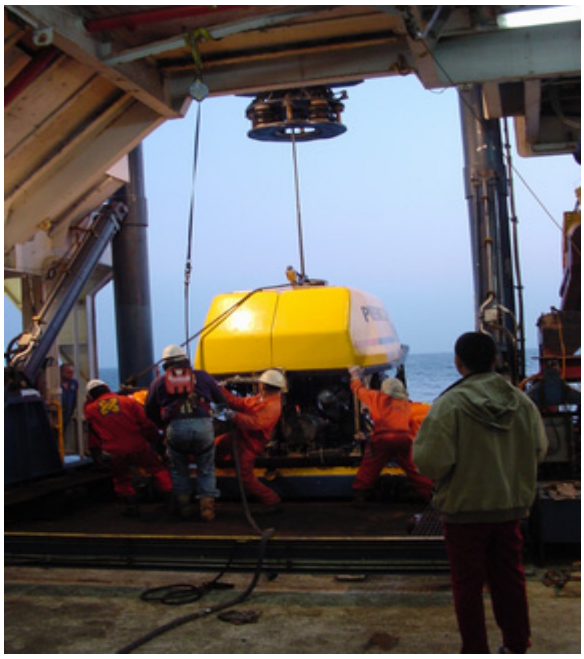

Figure 1.18-26 ROV operation on Ocean Hercules

On January 10th, 2003, marine weather at wind 7 kt, gust 9 kt, seas 4 m, underwater current 5kt to 6 kt. Although the condition was over operation criterion, but nonetheless Ocean Hercules sailed to the accident site, and attempted dynamic positioning to release the ROV for underwater search. However, due to rough seas, the dynamic positioning system suffered power cut several times, thus the attempt had to be aborted, and the ROV also could not operate in such strong current. The wind slowed down at 1600, and ROV began search operation. Areas of ROV search operation are NP-1, NP-2, NP-3, NP-5, NP-6 (Figure 1.18-27), only at NP-1 were small pieces of wreckages found.

Figure 1.18-27 ROV operation_launching

In early morning of January 11th, 2003, tidal current slowed down, ROV began filming operation at the eight sites provided by the Navy. Tiny pieces of wreckage were found at NP1, nothing other than coral reef was found at other sites. At 0900 the sea became rough, and ROV could not continue operation. After some discussion, decided to use underwater sonar side scan operation. The sonar side scan has a pinger installed, which could transmit precise scanned points onto the coordinates system.

Later, the underwater coordinates provided by Ocean Research II were used to plan sonar side scan range. Several target objects were found after twelve hours, their spread range were similar to the Ocean Research II data. When the current slowed down, an area of 350m^2 with 25m grids was mapped, and ROV was sent down to scan at 50m in diameters(Figure 1.18-28).

Figure 1.18-28 Visual check with ROV video camera and forward sonar scanning

At 0626 on January 12th, 2003, ROV discovered the FDR fore part and pinger, its orange casing came off. At 0800, ROV mechanical arm salvaged the FDR (Figure 1.18-29,30), and subsequently discovered wreckages such as: Brake disk, Engine mounting, Engine casing, Landing gear#2, Large engine part, Generator, etc. Work continued until 1630 when current became strong. The FDR was ferried to shore by Coast Guard vessel, and taken to ASC Lab by IIC.

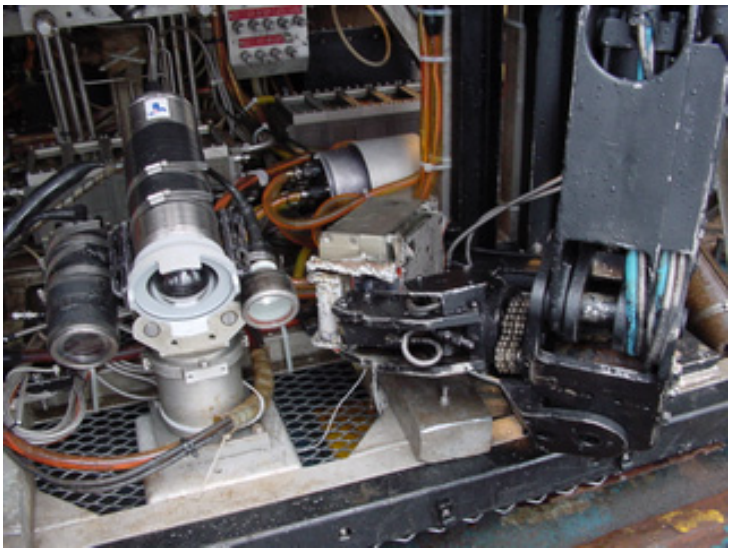

Figure 1.18-29 FDR recovered by ROV

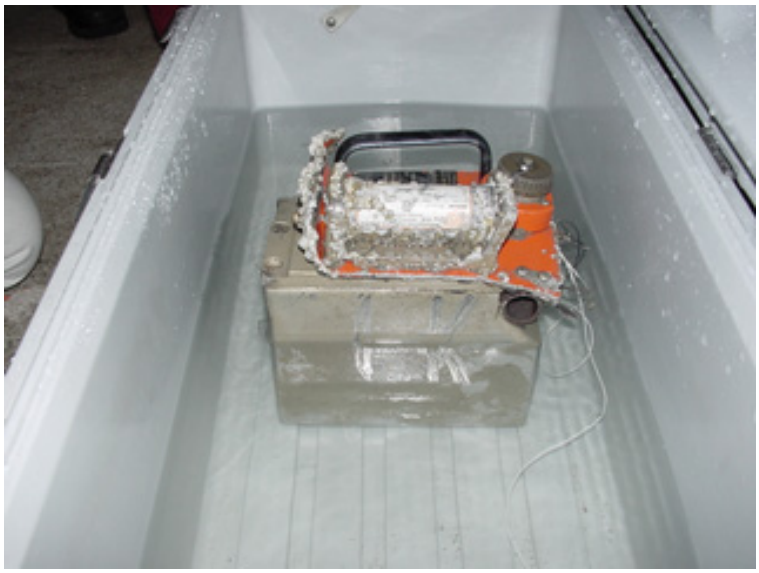

Figure 1.18-30 FDR close view while recovered

At 1740 on January 13th, 2003, ROV discovered CVR fore part（Crash Survivable Unit, CSU）, its pinger being lost, and without the orange casing. At 1900 ROV mechanical arm salvaged CVR (Figure 1.18-31,32), and subsequently discovered wreckages.

Figure 1.18-31 CVR recovered by ROV

Figure 1.18-32 CVR closed view while recovered

From January 14th to January 24th, 203, Ocean Hercules used scanned coordinates provided by Ocean Research II, to sweep and search the seabed, no further discoveries.

From January 21st to January 24th noon, Ocean Hercules continued salvaging operation (Figure 1.18-33), and salvaged several pieces of wreckage, including landing gear and engine propeller.

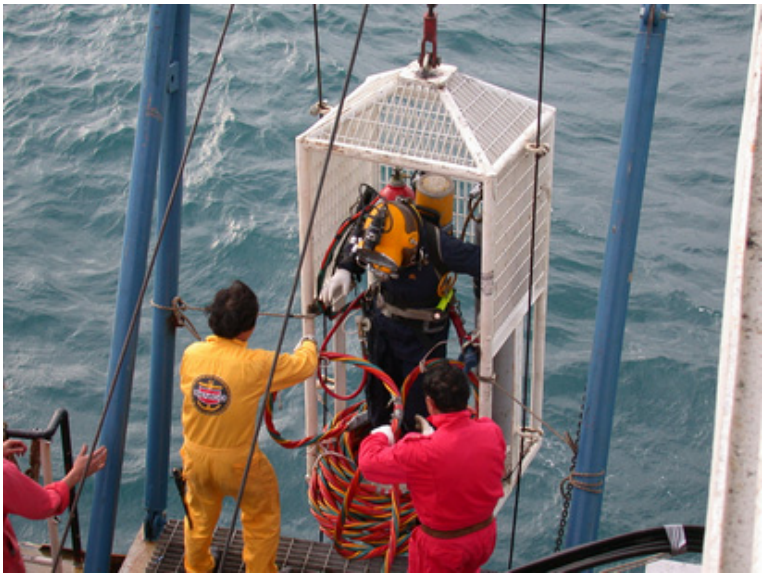

Figure 1.18-33 Diving operation

At 1200 on January 24th, 2003, Ocean Hercules ceased salvage operation. Wreckages on the deck were ferried to shore by Coast Guard vessel, then land transferred to and stored at the Air Force Base in Makung (Figure 1.18-

34).

Figure 1.18-34 Wreckage storage at Air Force base

During the Ocean Hercules salvage operation, ASC also planned trawler operation. After Ocean Hercules ceased salvaging, ASC coordinating with Tran Asia. In the domestic the CSIST had skills and experiences for CI611 recovery through trawlers. Therefore, It was hired by to provide technical supports, including trawling plan, equipment support and operation. Before getting underway, the CSIST had installed an Integrated Navigation System in each trawler and the control center. Its functions included GPS, track recording, trawling line management and real time position reporting to the control center. It helped trawlers to navigate at sea and allowed people to monitor the present positions and tracks of all trawlers at the control center。 During trawler operation from February 18th to March 24th, 2003, 102 wreckage pieces were salvaged, wreckage list as Appendix 3-1. Including the pieces salvaged by Ocean Hercules, there are a total of 199 wreckage pieces.

Ⅳ、 Appendix

3-1 Wreckage List

Tag No.	Date	Time	Latitude	Longitude	Zone	Description	ATA	Station From/To	Section From/To	Stringer From/To	Length	Width	Height	Remarks	Pages	Present Location	Destination
001	21/12/02	0600	23.21	119.23	Floating	Cargo Track	53		141/142		50cm	9cm	4.5cm	洋 56			
002	21/12/02	0840	23.25	119.26	Floating	V.STAB Skin PNL	55		322/324		115cm	55cm		洋 02			
003	21/12/02	0840	23.25	119.26	Floating	V.STAB Skin PNL	55		322/324		150cm	51cm		洋 05			
004	21/12/02	0840	23.25	119.26	Floating	V.STAB Skin PNL	55		322/324		83cm	30cm		洋 06			
005	21/12/02	0600	23.21	119.23	Floating	V.STAB Skin PNL	55		322/324		66cm	51cm		洋 23			
006	21/12/02	1100	23.23	119.22	Floating	V.STAB Skin PNL	55		322/324		45cm	41cm		洋 70			
007	21/12/02	1100	23.23	119.22	Floating	V.STAB Skin PNL	55		322/324		53cm	47cm		洋 81			
008	21/12/02	0810	23.25	119.26	Floating	V.STAB Skin PNL	55		322/324		70cm	57cm		洋 13			
009	21/12/02	0600	23.21	119.23	Floating	V.STAB Skin PNL	55		322/324		86cm	62cm		洋 24			
010	21/12/02	0600	23.21	119.23	Floating	V.STAB Skin PNL	55		322/324		25cm	24cm		洋 39			
011	21/12/02	1100	23.23	119.22	Floating	V.STAB Skin PNL	55		322/324		39cm	38cm		洋 83			
012	21/12/02	1100	23.23	119.22	Floating	V.STAB Skin PNL	55		322/324		74cm	24cm		洋 86			
013	21/12/02	0810	23.25	119.26	Floating	RUD L/E	55		326		103cm	43cm	25cm	洋 09			
014	21/12/02	0600	23.21	119.23	Floating	RUD Skin PNL	55		327		73cm	37cm		洋 47			
015	21/12/02	0600	23.21	119.23	Floating	RUD Skin PNL	55		327		33cm	31cm		洋 28			
016	21/12/02	0800	23.25	119.24	Floating	RUD Skin PNL	55		327		106cm	69cm		洋 61			
017					Floating	RUD Skin PNL	55		327		59cm	54cm		Unknown			
018					Floating	RUD Skin PNL	55		327		37cm	29cm		Unknown			
019					Floating	RUD Skin PNL	55		327		49cm	40cm		Unknown			
020	22/12/02	0930	23.23	119.30	Floating	RUD Skin PNL	55		327		40cm	33cm		洋 101			
021	22/12/02	0930	23.23	119.30	Floating	RUD Skin PNL	55		327		30cm	22cm		洋 104			
022	21/12/02	0810	23.25	119.26	Floating	RUD Trim Tab	55		328		69cm	25cm	6cm	洋 08			
023	21/12/02	0600	23.21	119.23	Floating	RUD Trim Tab	55		328		45cm	21cm	5.5cm	洋 29			
024	22/12/02	1545	水垵村西洞尾沿岸		Floating	RUD Trim Tab	55		328		70cm	24cm	6cm	洋 108			
025	21/12/02	0600	23.21	119.23	Floating	SPLR	57		543/643		49cm	41cm		洋 31			
026	21/12/02	0600	23.21	119.23	Floating	SPLR	57		543/643		40cm	28cm		洋 35			
027	21/12/02	1100	23.23	119.22	Floating	SPLR	57		543/643		69cm	40cm		洋 84			
028	21/12/02	0810	23.25	119.26	Floating	Tail Cone Skin	53		313/314		106cm	86cm		洋 10			
029	21/12/02	0810	23.25	119.26	Floating	Tail Cone Skin	53		313/314		57cm	50cm		洋 11			
030	21/12/02	0810	23.25	119.26	Floating	Tail Cone Skin	53		313/314		78cm	65cm		洋 12			
031	21/12/02	0600	23.21	119.23	Floating	Tail Cone Skin	53		313/314		82cm	67cm		洋 25			
032	21/12/02	0600	23.21	119.23	Floating	Tail Cone Skin	53		313/314		22cm	12cm		洋 38			
033	21/12/02	0600	23.21	119.23	Floating	Tail Cone Skin	53		313/314		22cm	15cm		洋 40			
034	21/12/02	1430	23.22	119.26	Floating	Tail Cone Skin	53		313/314		110cm	108cm		洋 88			
035	21/12/02	0800	23.25	119.27	Floating	Tail Cone Skin	53		313/314		87cm	66cm		洋 98			
036	21/12/02	1350	23.27	119.23	Floating	Tail Cone Skin	53		313/314		80cm	52cm		N-004			
037	21/12/02	1258	23.27	119.24	Floating	Fairing	53		191/195		40cm	32cm		N-002			
038	21/12/02	0600	23.21	119.23	Floating	Fairing	53		191/195		47cm	39cm		洋 49			
039	21/12/02	0810	23.25	119.26	Floating	Fairing	53		293/294		62cm	47cm		洋 15			

040	21/12/02	0600	23.21	119.23	Floating	Fairing	53		191/195		62cm	35cm		洋 20			
041	21/12/02	0600	23.21	119.23	Floating	Fairing	53		191/195		30cm	28cm		洋 33			
042	21/12/02	0600	23.21	119.23	Floating	Fairing	53		191/195		36cm	33cm		洋 50			
043	21/12/02	0800	23.25	119.24	Floating	Fairing	53		191/195		41cm	19cm		洋 64			
044	21/12/02	0800	23.25	119.24	Floating	Fairing	53		191/195		29cm	26cm		洋 65			
045	21/12/02	1100	23.23	119.22	Floating	Fairing	53		191/195		68cm	43cm		洋 66			
046	21/12/02	1100	23.23	119.22	Floating	Fairing	53		191/195		27cm	24cm		洋 69			
047	22/12/02	0930	23.23	119.30	Floating	Fairing	53		191/195		53cm	22cm		洋 100			
048	21/12/02	0600	23.21	119.23	Floating	Fairing	53		191/195		62cm	22cm		洋 26			
049	21/12/02	1245	23.28	119.24	Floating	Cargo Floor PNL	25		141/142		32cm	18cm		N-001			
050	21/12/02	0600	23.21	119.23	Floating	Cargo Floor PNL	25		141/142		33cm	21cm		洋 32			
051	21/12/02	0600	23.21	119.23	Floating	Cargo Floor PNL	25		141/142		28cm	19cm		洋 42			
052	21/12/02	0600	23.21	119.23	Floating	Cargo Floor PNL	25		141/142		43cm	17cm		洋 44			
053	21/12/02	0600	23.21	119.23	Floating	Cargo Floor PNL	25		141/142		20cm	16cm		洋 46			
054	21/12/02	0600	23.21	119.23	Floating	Cargo Floor PNL	25		141/142		95cm	35cm		洋 48			
055	21/12/02	0800	23.25	119.24	Floating	Cargo & Floor	25		141/142		210cm	17cm		洋 62			
056	21/12/02	0800	23.25	119.24	Floating	Cargo Floor PNL	25		141/142		42cm	31cm		洋 63			
057	21/12/02	0600	23.21	119.23	Floating	PAX Door Step	52		834		53cm	30cm		洋 45			
058	21/12/02	1330	23.27	119.24	Floating	PAX Door Step	52		834		53cm	32cm	21cm	N-003			
059	21/12/02	1135	23.27	119.24	Floating	ADF#1 ANT	34		253		45cm	32cm	20cm	N-006			
060	21/12/02	1135	23.27	119.24	Floating	COM HF Coupler	23		264		31cm	20cm	14cm	N-005			
061	21/12/02	0600	23.21	119.23	Floating	Cargo Lining PNL	25		251/252		24cm	17cm		洋 43			
062	21/12/02	0600	23.21	119.23	Floating	Elevator	55		334		35cm	33cm	11cm	洋 21			
063	21/12/02	0600	23.21	119.23	Floating	Elevator	55		334		50cm	39cm	12cm	洋 22			
064	21/12/02	0600	23.21	119.23	Floating	Elevator	55		334		35cm	24cm	11cm	洋 34			
065					Floating	Elevator	55		334		48cm	38cm	12cm	Unknown			
066					Floating	Elevator	55		334		37cm	24cm	11cm	Unknown			
067	21/12/02	0840	23.25	119.26	Floating	Flap Skin PNL	57		541/542		145cm	40cm		洋 07			
068	21/12/02	0600	23.21	119.23	Floating	Flap Skin PNL	57		541/542		48cm	25cm		洋 30			
069	21/12/02	0600	23.21	119.23	Floating	Flap Skin PNL	57		541/542		37cm	24cm		洋 36			
070	21/12/02	0600	23.21	119.23	Floating	Flap Skin PNL	57		541/542		27cm	13cm		洋 41			
071	21/12/02	0600	23.21	119.23	Floating	Flap Skin PNL	57		541/542		42cm	22cm		洋 51			
072	21/12/02	1100	23.23	119.22	Floating	Flap Skin PNL	57		541/542		44cm	37cm		洋 82			
073	21/12/02	1430	23.22	119.26	Floating	Flap Skin PNL	57		541/542		43cm	32cm		洋 87			
074	22/12/02	0930	23.23	119.30	Floating	Flap Skin PNL	57		541/542		39cm	33cm		洋 102			
075					Floating	Flap Skin PNL	57		541/542		60cm	11cm		Unknown			
076					Floating	Flap Skin PNL	57		541/542		65cm	39cm		Unknown			
077					Floating	Flap Skin PNL	57		541/542		110cm	30cm		Unknown			
078					Floating	Flap Skin PNL	57		541/542		63cm	36cm		Unknown			
079					Floating	Flap Skin PNL	57		541/542		74cm	42cm		Unknown			
080	21/12/02	0600	23.21	119.23	Floating	Wing T/E PNL	57		530/533		44cm	23cm		洋 27			
081	21/12/02	1100	23.23	119.22	Floating	Wing T/E PNL	57		530/533		45cm	20cm		洋 67			

082	21/12/02	1100	23.23	119.22	Floating	Wing T/E PNL	57		530/533		36cm	18cm		洋 68			
083	21/12/02	1100	23.23	119.22	Floating	Wing T/E PNL	57		530/533		44cm	35cm		洋 85			
084					Floating	Wing T/E PNL	57		530/533		40cm	37cm		Unknown			
085					Floating	Wing T/E PNL	57		530/533		45cm	30cm		Unknown			
086					Floating	Wing T/E PNL	57		530/533		37cm	31cm		Unknown			
087	21/12/02	0600	23.21	119.23	Floating	AFT UP ENG Cowl	54		475/476		30cm	26cm		洋 37			
088	12/01/03	F:0626 T:0640	23°28.760'	119° 26..296'		DFDR S/N 3490	31		FR46		30cm	25cm		O.H:001			
89	13/01/03	F:1640 T:1550	23° 28.7569'	119° 26..2954'		CVR P/N 93A100	31		FR46		35cm	26cm		O.H:002			
90	16/01/03	16:45	23° 28.7593'	119° 26.3004'		FIRE WALL	70		475/485		100cm	60cm		O.H:003			
91	16/01/03	16:45	23° 28.7593'	119° 26.3004'		Propeller Blade	61		412/422		130cm	25cm		O.H:004			
92	16/01/03	16:45	23° 28.7593'	119° 26.3004'		Landing Gear and Fuselage Panel	32		741		120cm	75cm		O.H:005			
93	19/01/03	16:54	23° 28.7569'	119° 26.3309'		Frame piece	53		200		20cm	15cm		O.H:006			
94	19/01/03	16:43	23° 28.7245'	119° 26.3324'		VALVE	28		510/610		15cm	15cm		O.H:007			
95	19/01/03	14:43	23° 28.7171'	119° 26.3324'		SEAT TRACK	53		141/142		40cm	5cm		O.H:008			
96	23/01/03	09:50	23° 28.7499'	119° 26.3066'		NP Indicator (Propeller speed indicator)	61		FR4/FR5		10cm	10cm		O.H:009			
97	23/01/03	09:50	23° 28.7448'	119° 26.3089'		Window Frame	53		200		30cm	25cm		O.H:010			

The following pages show the list in the trawler operation

Tag No.	Date	Time	Latitude	Longitude	Zone	Description	ATA	Station From/To	Section From/To	Stringer From/To	Length	Width	Height	Remarks	Pages	Present Location	Destination
098	18/02/03				Sea Bed	Wing Skin PNL	57		520/620		86cm	30cm	3cm	漁 001			
099	18/02/03				Sea Bed	Wing Structure	57		500/600		55cm	5cm	4cm	漁 002			
100	18/02/03				Sea Bed	Pipe	28		500/600		54cm	22cm	3cm	漁 003			
101	21/02/03				Sea Bed	L/G	32		731/741		60cm	14cm	4cm	漁 004			
102	21/02/03				Sea Bed	Wing Skin PNL	57		520		167cm	41cm	3cm	漁 005			
103	21/02/03				Sea Bed	Exhaust Pipe	71		479/489		65cm	34cm	24cm	漁 006			
104	21/02/03				Sea Bed	Window Frame	53		200		56cm	40cm	2cm	漁 007			
105	21/02/03				Sea Bed	V.STAB Skin	55		320		102cm	44cm	23cm	漁 008			
106	22/02/03				Sea Bed	Bleed Duct	36		FR23		110cm	54cm	2cm	漁 009			
107	22/02/03				Sea Bed	RUD L/E	55		320		54cm	34cm	13cm	漁 010			
108	22/02/03				Sea Bed	V.STAB Structure	55		320		97cm	38cm	15cm	漁 011			
109	22/02/03				Sea Bed	A/C Skin	53		200		46cm	36cm	3cm	漁 012			
110	22/02/03				Sea Bed	A/C Skin	53		200		43cm	33cm	8cm	漁 013			
111	22/02/03				Sea Bed	A/C Skin	53		200		70cm	35cm	1cm	漁 014			
112	22/02/03				Sea Bed	A/C Skin	53		200		85cm	50cm	10cm	漁 015			
113	23/02/03				Sea Bed	A/C Skin	53		200		80cm	30cm	10cm	漁 016			
114	23/02/03				Sea Bed	A/C Skin	53		200		60cm	39cm	10cm	漁 017			
115	26/02/03				Sea Bed	Wing Skin PNL	57		520		103cm	46cm	7cm	漁 018			
116	26/02/03				Sea Bed	Wing Structure	57		540/640		110cm	33cm	6cm	漁 019			
117	26/02/03				Sea Bed	Wing Structure	57		520/620		60cm	38cm	7cm	漁 020			
118	26/02/03				Sea Bed	SVC Door	52		840		108cm	46cm	4cm	漁 021			
119	26/02/03				Sea Bed	Wheel	32		731/741		39cm	29cm	14cm	漁 022			
120	26/02/03				Sea Bed	A/C Structure	53		FR25		75cm	39cm	4cm	漁 023			
121	26/02/03				Sea Bed	MECH Rod	53		540/640		56cm	3cm	8cm	漁 024			
122	26/02/03				Sea Bed	A/C Structure	53		FR47		135cm	6cm	1cm	漁 025			
123	26/02/03				Sea Bed	A/C Skin	53		200		30cm	9cm	2cm	漁 026			
124	26/02/03				Sea Bed	V.STAB Structure	55		320		65cm	54cm	20cm	漁 027			
125	27/02/03				Sea Bed	ENG Tail Cowl	71		477/487		40cm	38cm	0.5cm	漁 028			
126	27/02/03				Sea Bed	No SMK Sign PNL	25		FR39		40cm	34cm	0.5cm	漁 029			
127	27/02/03				Sea Bed	A/C Skin	53		200		37cm	17cm	0.3cm	漁 030			
128	27/02/03				Sea Bed	A/C Structure	53		FR38		88cm	29cm	0.3cm	漁 031			
129	27/02/03				Sea Bed	A/C Structure	53		FR39		60cm	16cm	3cm	漁 032			
130	27/02/03				Sea Bed	Wing Structure	57		620		166cm	75cm	4cm	漁 033			
131	27/02/03				Sea Bed	Wing Structure	57		FR26		184cm	75cm	4cm	漁 034			
132	27/02/03				Sea Bed	Wing Structure	57		540/640		84cm	34cm	4cm	漁 035			
133	28/02/03				Sea Bed	Cargo Track	53		141/142		48cm	9cm	3cm	漁 036			
134	28/02/03				Sea Bed	Wing Structure	57		520/620		48cm	4cm	1cm	漁 037			
135	28/02/03				Sea Bed	A/C Skin	53		FR40		200cm	94cm	16cm	漁 038			

136	28/02/03				Sea Bed	Wheel and BRK	32		731/741		73cm	45cm	20cm	漁 039			
137	28/02/03				Sea Bed	A/C Structure	53		200		49cm	6cm	0.3cm	漁 040			
138	28/02/03				Sea Bed	A/C Structure	53		200		75cm	9cm	1cm	漁 041			
139	28/02/03				Sea Bed	Wing Structure	57		530/630		50cm	13cm	10cm	漁 042			
140	28/02/03				Sea Bed	Cargo Track	53		141/142		55cm	8cm	5cm	漁 043			
141	28/02/03				Sea Bed	A/C Skin	53		200		34cm	10cm	0.2cm	漁 044			
142	28/02/03				Sea Bed	Wing Structure	57		530/630		36cm	16cm	0.3cm	漁 045			
143	28/02/03				Sea Bed	Fairing	57		550/650		25cm	18cm	6cm	漁 046			
144	28/02/03				Sea Bed	Fairing	53		191/195		56cm	22cm	0.3cm	漁 047			
145	28/02/03				Sea Bed	A/C Skin	53		200		56cm	22cm	14cm	漁 048			
146	28/02/03				Sea Bed	Cargo Liner	25		141/142		55cm	37cm	0.2cm	漁 049			
147	28/02/03				Sea Bed	RCAU Cover	23		FR12		21cm	13cm	0.3cm	漁 050			
148	28/02/03				Sea Bed	A/C Structure	53		200		85cm	50cm	30cm	漁 051			
149	28/02/03				Sea Bed	Cargo					120cm	9cm	4cm	漁 052			
150	28/02/03				Sea Bed	Window Frame	53		FR19		72cm	21cm	3cm	漁 053			
151	28/02/03				Sea Bed	Wing Structure	57		530/630		79cm	40cm	0.4cm	漁 054			
152	28/02/03				Sea Bed	A/C Structure	53		200		24cm	8cm	0.2cm	漁 055			
153	01/03/03				Sea Bed	A/C Skin	53		FR40		158cm	151cm	73cm	漁 056			
154	01/03/03				Sea Bed	HYD Pipe	29				78cm	0.5cm	0.5cm	漁 057			
155	01/03/03				Sea Bed	Bundle	24				101cm	0.3cm	0.3cm	漁 058			
156	01/03/03				Sea Bed	A/C Skin	53		200		39cm	20cm	0.2cm	漁 059			
157	01/03/03				Sea Bed	A/C Structure	53		200		45cm	8cm	3cm	漁 060			
158	01/03/03				Sea Bed	Flap Structure	57		550/650		52cm	43cm	8cm	漁 061			
159	01/03/03				Sea Bed	A/C Structure	53		200		79cm	19cm	6cm	漁 062			
160	01/03/03				Sea Bed	A/C Structure	53		FR24		98cm	42cm	13cm	漁 063			
161	01/03/03				Sea Bed	A/C Skin	53		200		36cm	30cm	17cm	漁 064			
162	01/03/03				Sea Bed	Tire	32		731/741		74cm	25cm	6cm	漁 065			
163	01/03/03				Sea Bed	A/C Structure	53		200		98cm	11cm	5cm	漁 066			
164	01/03/03				Sea Bed	A/C Skin	53		200		55cm	28cm	12cm	漁 067			
165	01/03/03				Sea Bed	A/C Structure	53		FR25		142cm	72cm	8cm	漁 068			
166	01/03/03				Sea Bed	Flap Structure	57		630		148cm	44cm	27cm	漁 069			
167	01/03/03				Sea Bed	A/C Skin	53		FR21		59cm	46cm	0.3cm	漁 070			
168	01/03/03				Sea Bed	A/C Skin	53		200		30cm	24cm	0.2cm	漁 071			
169	01/03/03				Sea Bed	A/C Skin	53		FR23		85cm	70cm	12cm	漁 072			
170	01/03/03				Sea Bed	A/C Skin	53		FR42		82cm	6cm	14cm	漁 073			
171	01/03/03				Sea Bed	Wing Structure	57		520/620		150cm	5cm	4cm	漁 074			
172	01/03/03				Sea Bed	A/C Structure	53		200		90cm	5cm	4cm	漁 075			
173	01/03/03				Sea Bed	A/C Structure	53		200		37cm	19cm	2cm	漁 076			
174	01/03/03				Sea Bed	Plate	53		FR41		74cm	7cm	0.2cm	漁 077			
175	02/03/03				Sea Bed	A/C Skin	53		200		28cm	19cm	0.2cm	漁 078			
176	02/03/03				Sea Bed	A/C Skin	53		200		86cm	34cm	0.3cm	漁 079			

177	02/03/03				Sea Bed	Wing Skin	57		530/630		60cm	24cm	6cm	漁 080			
178	02/03/03				Sea Bed	A/C Structure	53		200		65cm	29cm	7cm	漁 081			
179	02/03/03				Sea Bed	A/C Structure	53		200		64cm	15cm	5cm	漁 082			
180	02/03/03				Sea Bed	A/C Structure	53		200		87cm	46cm	8cm	漁 083			
181	02/03/03				Sea Bed	A/C Structure	53		FR46		97cm	71cm	29cm	漁 084			
182	02/03/03				Sea Bed	Plate	53		FR41		60cm	25cm	2cm	漁 085			
183	02/03/03				Sea Bed	A/C Skin	53		FR43		100cm	40cm	9cm	漁 086			
184	02/03/03				Sea Bed	Plate	53		FR38		69cm	18cm	3cm	漁 087			
185	02/03/03				Sea Bed	Wing Structure	57		520/620		42cm	30cm	12cm	漁 088			
186	02/03/03				Sea Bed	Wing Structure	57		520/620		56cm	19cm	2cm	漁 089			
187	02/03/03				Sea Bed	A/C Structure	53		FR37		57cm	19cm	3cm	漁 090			
188	02/03/03				Sea Bed	A/C Skin	53		200		45cm	33cm	3cm	漁 091			
189	02/03/03				Sea Bed	A/C Skin	53		FR41		63cm	43cm	13cm	漁 092			
190	02/03/03				Sea Bed	A/C Skin	53		FR40		109cm	53cm	5cm	漁 093			
191	02/03/03				Sea Bed	DE-ICE PR SW	30		435/445		22cm	11cm	3cm	漁 094			
192	02/03/03				Sea Bed	DE-ICE Boot	30		510/610		29cm	17cm	0.2cm	漁 095			
193	02/03/03				Sea Bed	Wing Structure	57		530/630		51cm	30cm	0.3cm	漁 096			
194	02/03/03				Sea Bed	A/C Structure	53		200		33cm	24cm	3cm	漁 097			
195	02/03/03				Sea Bed	Wing Structure	57		530/630		63cm	29cm	0.2cm	漁 098			
196	02/03/03				Sea Bed	A/C Skin	53		200		45cm	30cm	0.2cm	漁 099			
197	02/03/03				Sea Bed	Pilot Seat Structure	25		FR8		34cm	18cm	1cm	漁 100			
198	05/03/03				Sea Bed	A/C Structure	53		FR45		205cm	135cm	6cm	漁 101			
199	13/03/03				Sea Bed	Flap Structure	57		550/650		140cm	30cm	3cm	漁 102			