REPUBLICA DE CHILE
DIRECCION GENERAL DE AERONAUTICA CIVIL

DGAC CHILE

GOBIERNO DE CHILE

TYPE CERTIFICATE VALIDATION ACT

N° : H – A44 – 01 / 07
20 April 2007

1.- **In accordance with the records and documents submitted by Rotary Wing Research & Design Centre, Hindustan Aeronautics Limited, domiciled in: 15/1 Cubbon Road, Bangalore, India, it has been established that the aeronautical product identified below is of a design, materials, specifications, construction and appropriate performance for a safe operation and it satisfies the current requirements stated in the Standards and Regulations as effective in the Republic of Chile,**

PRODUCT	**:**	**HELICOPTER**
MAKE	**:**	**RWR&DC, HAL**
MODELS	**:**	**DHRUV (ALH) C, CFW and CS**

2.- **It is recognized as valid the Type Certificate N° 5-8/96-RD-TC-1 and its related Data Sheet, revision 5, dated 19th February 2007, as issued by the Directorate General of Civil Aviation, for the helicopter above identified, in Transport Category, in accordance with the conditions and limitations prescribed in the Type Acceptance Data Sheet N° H-A44-01/07 issued by this DGAC.**

LORENZO SEPULVEDA B.
JEFE DEPARTAMENTO
SEGURIDAD OPERACIONAL

JOSE HUEPE P.
DIRECTOR GENERAL
AERONAUTICA CIVIL

REPUBLICA DE CHILE
DIRECCION GENERAL DE AERONAUTICA CIVIL

DGAC CHILE

GOBIERNO DE CHILE

No. H-A44-01/07
RWR&DC, HAL

DHRUV (C)
DHRUV (CFW)
DHRUV (CS)

Dated 20 April 2007

TYPE ACCEPTANCE DATA SHEET No. H-A44-01/07

This Data Sheet, which is a part of Type Certificate Validation Act No. H-A44-01/07, prescribes the conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Chilean Aeronautical Regulations.

Type Certificate Holder: Rotary Wing Research & Design Centre,
HINDUSTAN AERONAUTICS LTD,
15/1, Cubbon Road,
Bangalore – 560 001,
INDIA.

I. MODEL DHRUV (C), (TRANSPORT CATEGORY A AND B), APPROVED 31st OCTOBER 2003

Engines: (2) TURBOMECA, TM 333 2B2:
(EASA Type Certificate No. E.030)

Fuel:

Type of Fuel	NATO Symbol	Specification		
		USA	UK	France
Kerosene-50 (AVTUR) JP1	F35	ASTM-D-1655 Jet A1	D.ENG.RD 2494	AIR3405-F-35

Fuel Additive: See Note 4 on fuel additives.

Engine Limits:

	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
All Engines Operating				
Take-Off: 30 Min.	123.0	314.5	45,088	897
Max. Continuous	108.8	314.5	44,361	853

One Engine In Operative	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
Super Contingency: 30 Sec	151.9	314.5	45,864	985
Max. Contingency: 2 min.	151.9	314.5	45,229	917
Take-Off: 30 Min.	136.0	314.5	44,946	897

Rotor Speed limits:

	Continuous (%)		Transient (%)	
	Min	Max	Min	Max
Power on	90	102	90	107
Power off	85	110	80	115

(Normal speed 314.5 rpm – 100%)

Transmission Torque Limits:

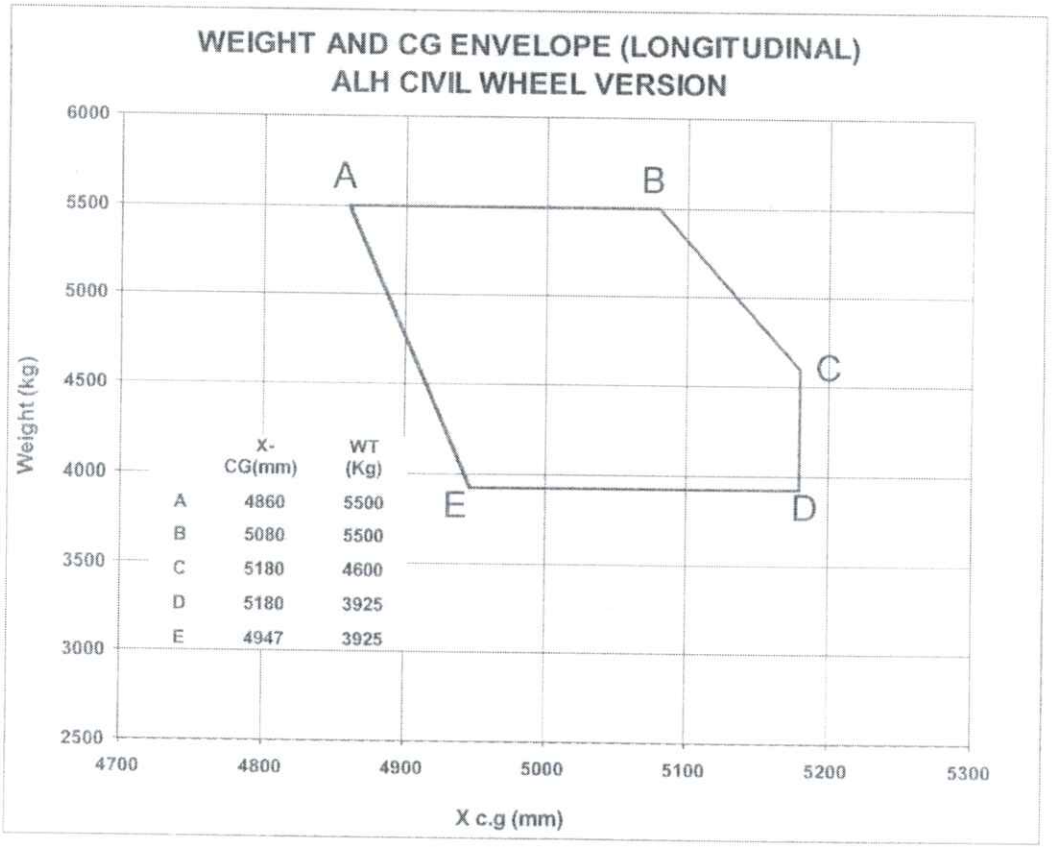
	Power Rating	MGB Torque Limit (Nm)
One Engine inoperative (OEI)		
Super Contingency – 30 Sec	1 x 800 Kw	1270
Max. Contingency – 2 min 30 Sec	1 x 700 Kw	1114
All Engine Operating (AEO)		
Take-Off (TOP) – 30 min	2 x 640 Kw	1014
Max. Continuous Power (MCP)	2 x 568 Kw	902

Airspeed Limits:

V_{NE} (Never Exceed) 155 Knots (IAS) at Sea Level at OAT of 20°C. (See Rotorcraft Flight Manual for variations of V_{NE} with gross weight and density altitude)

	Knots (IAS)
V_{NE} (Power – Off)	100
V_{LO} (Landing Gear Operation)	120
Max. Sideward (Nil wind condition)	27
Max. Rearward (Nil wind condition)	17
Max. Taxi Ground Speed	30
Max. speed with external cargo	55

Centre of Gravity Range The CG range for different weights is as shown below:



Empty Weight C.G Range None.

Maximum Weight Max. Cat A Take-off & landing weight at sea level: 5300 Kg
Max. Cat B Take-off & landing weight at sea level: 5500 Kg

Maximum External Load 1500 Kg (see Note 5 on Maximum All Up Weight)

Maximum External Load for Rescue Hoist 250 Kg (see Note 5 on Maximum All Up Weight)

Minimum Flight Crew 2 pilots

Number of seats Maximum 12 (excluding pilot seats)

Maximum Baggage 250 Kg (550 lbs) at + X6548 mm from datum,
Floor Loading density = 600 Kg/Sq. M

Fuel Capacity Usable : 1108 Kg
Unusable : 8 Kg
(See Note 1 for unusable fuel in empty weight CG range)

Oil Capacity	Capacity 7 Litres Critical 1.5 Litres
Max. Operating Altitude	Cruise: 20,000 feet pressure altitude (with AUW of 4500 Kg) and 14500 feet pressure altitude (with AUW of 5500 Kg) Hover: (IGE) 15,000 feet pressure altitude with AUW of 4000 Kg Cat-A take-off and landing: 10,600 feet pressure altitude for corresponding AUW at ISA + 20°C (Refer Rotorcraft Flight Manual). Cat-B take-off and landing: 15,000 feet pressure altitude for corresponding AUW at ISA + 20°C (Refer Rotorcraft Flight Manual).
Max. Operating Temperature	-30°C to +50°C
Production Basis	DHRUV (ALH) is manufactured by HAL, Bangalore under DGCA Approval Certificate No. DAW/BLR/CAR 21/POA/001, dated 25-11-2004.
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification basis) must be installed in the helicopter for certification.
Servicing Information	DGCA approved Rotorcraft Flight Manual (ALH-MP-PTC-002), Master Servicing Recommendations and Master Minimum Equipment List.
Additional Conditions and Operating Limitations	All parts, components, instruments, equipment, avionics systems and associated software are parts of the type certified helicopter. Any non-conformance of these items with the approved design data and production process and / or any deviation from the Standard of Preparation (SOP) (Doc. No. RC/ALHC/DCD/SOP/001, Issue-II, Rev-A, dated 24-03-05) along with Modifications (MODs) and Service Bulletins (SBs) will require qualification testing and approval by DGCA for installation on the helicopter.

Certification Basis

- Type Certificate No. 5-8/96-RD-TC-1, dt. 31-10-03, Date of application: 08-07-2000.
- FAR-29, Amdt No. 1 through 47 as on 9th May 2001.
- CAR Section -II, Series I, Part II & Series O, Part IV.
- *Special Conditions*: High Intensity Radiated Fields (HIRF). (See Note 10 on HIRF)
- *Engine Certification Basis*: JAR – E Change 6 as on 28-08-1981.
- *Noise Certification Basis*: ICAO Annex – 16, Chapter 8.
- Equivalent Safety Findings (See Note 11 for Equivalent Level of Safety (ELOS) findings).
- Compliance with Ditching provisions of FAR 29.563, 29.801, 29.807 (d), 29.1411, 29.1415 & 29.1561 have been complied. (See Note 7 on Icing limitations)

2. **MODEL DHRUV (CFW) (TRANSPORT CATEGORY A AND B), APPROVED 20th APRIL 2005**

Engines (2) Turbomeca, TM 333-2B2:
(EASA Type Certificate No. E.030)

Fuel:

Type of Fuel	NATO Symbol	Specification		
		USA	UK	France
Kerosene-50 (AVTUR) JP1	F35	ASTM-D-1655 Jet A1	D.ENG.RD 2494	AIR3405-F-35

Fuel Additive: See Note 4 on fuel additives.

Engine Limits:

	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
All Engines Operating				
Take-Off: 30 Min.	123.0	314.5	45,088	897
Max. Continuous	108.8	314.5	44,361	853

	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
One Engine In Operative				
Super Contingency: 30 Sec	151.9	314.5	45,864	985
Max. Contingency: 2 min.	151.9	314.5	45,229	917
Take-Off: 30 Min.	136.0	314.5	44,946	897

Rotor Speed limits:

	Continuous (%)		Transient (%)	
	Min	Max	Min	Max
Power on	90	102	90	107
Power off	85	110	80	115

(Normal speed 314.5 rpm – 100%)

Transmission Torque Limits:

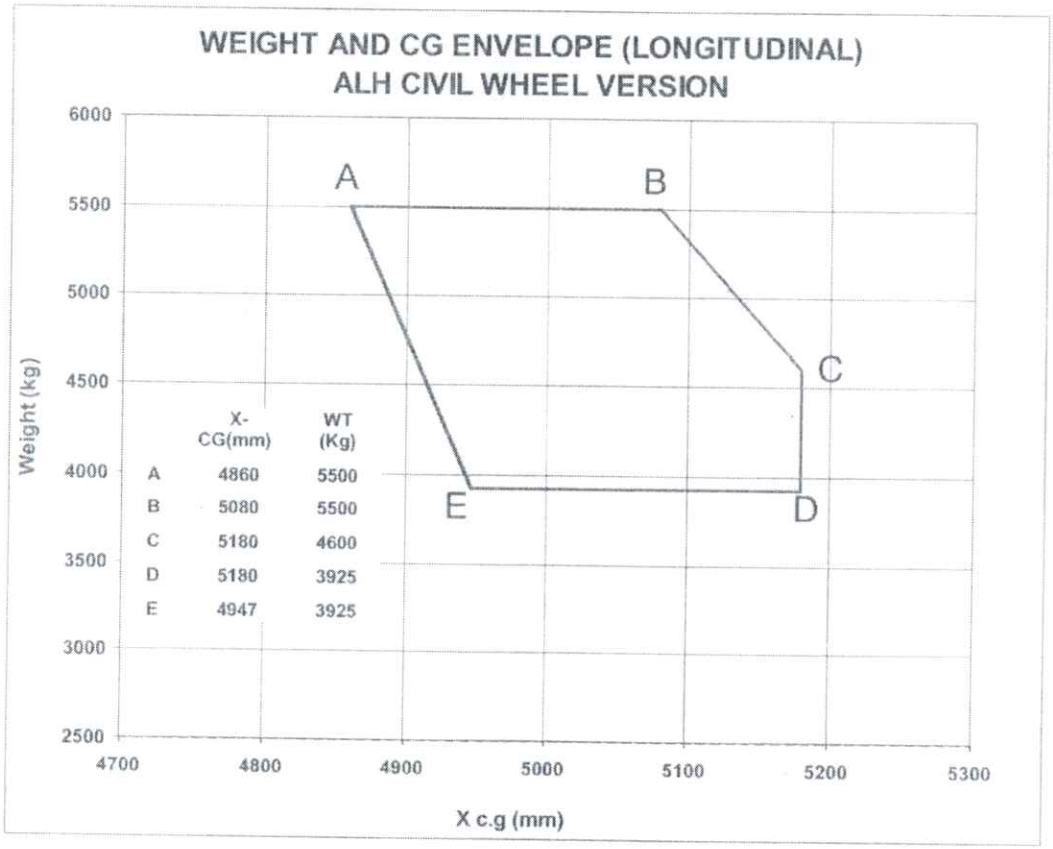
	Power Rating	MGB Torque Limit (Nm)
One Engine inoperative (OEI)		
Super Contingency – 30 Sec	1 x 800 Kw	1270
Max. Contingency – 2 min 30 Sec	1 x 700 Kw	1114
All Engine Operating (AEO)		
Take-Off (TOP) – 30 min	2 x 640 Kw	1014
Max. Continuous Power (MCP)	2 x 568 Kw	902

Airspeed Limits:

V_{NE} (Never Exceed) 155 Knots (IAS) at Sea Level at OAT of 20°C. (See Rotorcraft Flight Manual for variations of V_{NE} with gross weight and density altitude)

	Knots (IAS)
V_{NE} (Power – Off)	100
Max. Sideward (Nil wind condition)	27
Max. Rearward (Nil wind condition)	17
Max. Taxi Ground Speed	30
Max. speed with external cargo	55

Centre of Gravity Range The CG range for different weights is as shown below:



Empty Weight C.G Range None.

Maximum Weight Max. Cat A Take-off & landing weight at sea level : 5300 Kg
Max. Cat B Take-off & landing weight at sea level: 5500 Kg

Maximum External Load 1500 Kg (see Note 5 on Maximum All Up Weight)

Maximum External Load for Rescue Hoist 250 Kg (see Note 5 on Maximum All Up Weight)

Minimum Flight Crew 2 pilots

Number of seats	Maximum 12 (excluding pilot seats)
Maximum Baggage	250 Kg (550 lbs) at + X6548 mm from datum. Floor Loading density = 600 Kg/Sq. M
Fuel Capacity	Usable : 1108 Kg Unusable : 8 Kg (See Note 1 for unusable fuel in empty weight CG range)
Oil Capacity	Capacity 7 Litres Critical 1.5 Litres
Max. Operating Altitude	Cruise: 20,000 feet pressure altitude (with AUW of 4500 Kg) and 14500 feet pressure altitude (with AUW of 5500 Kg) Hover: (IGE) 15,000 feet pressure altitude with AUW of 4000 Kg Cat-A take-off and landing: 10,600 feet pressure altitude for corresponding AUW at ISA + 20°C (Refer Rotorcraft Flight Manual). Cat-B take-off and landing: 15,000 feet pressure altitude for corresponding AUW at ISA + 20°C (Refer Rotorcraft Flight Manual)
Max. Operating Temperature	-30°C to +50°C
Production Basis	DHRUV (ALH) is manufactured by HAL, Bangalore under DGCA Approval Certificate No. DAW/BLR/CAR 21/POA/001, dated 25-11-2004.
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification basis) must be installed in the helicopter for certification.
Servicing Information	DGCA approved Rotorcraft Flight Manual ALH-CFW-FM001, Master Servicing Recommendations and Master Minimum Equipment List.
Additional Conditions and Operating Limitations	All parts, components, instruments, equipment, avionics systems and associated software are parts of the type certified helicopter. Any non – conformance of these items with the approved design data and production process and / or any deviation from the Standard of Preparation (SOP) (Doc No. RC/ALHC/DCD/SOP/002, Issue-I, Rev-A, dated 24-03-05) along with Modifications (MODs) and Service Bulletins (SBs) will require qualification testing and approval by DGCA for installation on the helicopter.

Certification Basis

- Type Certificate No. 5-8/96-RD-TC-1, dt. 20-04-05. Date of application; 08-07-2000.
- FAR-29, Amdt No. 1 through 47 as on 9th May 2001.
- CAR Section -II, Series I, Part II & Series O, Part IV.
- *Special Conditions*: High Intensity Radiated Fields (HIRF). (See Note 10 on HIRF)
- *Engine Certification Basis*: JAR – E Change 6 as on 28-08-1981.
- *Noise Certification Basis*: ICAO Annex – 16, Chapter 8.
- Equivalent Safety Findings (See Note 11 for Equivalent Level of Safety (ELOS) findings).
- Compliance with Ditching provisions of FAR 29.563, 29.801, 29.807 (d), 29.1411, 29.1415 & 29.1561 have been complied. (See Note 7 on Icing limitations)

3 MODEL DHRUV (CS) (TRANSPORT CATEGORY A AND B), APPROVED 30th JULY 2004

Engines (2) Turbomeca, TM 333-2B2:
(EASA Type Certificate No. E.030)

Fuel:

Type of Fuel	NATO Symbol	Specification		
		USA	UK	France
Kerosene-50 (AVTUR) JP1	F35	ASTM-D-1655 Jet A1	D.ENG.RD 2494	AIR3405-F-35

Fuel Additive: See Note 4 on fuel additives.

Engine Limits:

	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
All Engines Operating				
Take-Off: 30 Min.	123.0	314.5	45,088	897
Max. Continuous	108.8	314.5	44,361	853

	Engine Torque da-Nm	Main Rotor Speed (RPM)	Gas Generator Speed (RPM)	Measured Gas Temperature (°C)
One Engine In Operative				
Super Contingency: 30 Sec	151.9	314.5	45,864	985
Max. Contingency: 2 min.	151.9	314.5	45,229	917
Take-Off: 30 Min.	136.0	314.5	44,946	897

Rotor Speed limits:

	Continuous (%)		Transient (%)	
	Min	Max	Min	Max
Power on	90	102	90	107
Power off	85	110	80	115

(Normal speed 314.5 rpm – 100%)

Transmission Torque Limits:

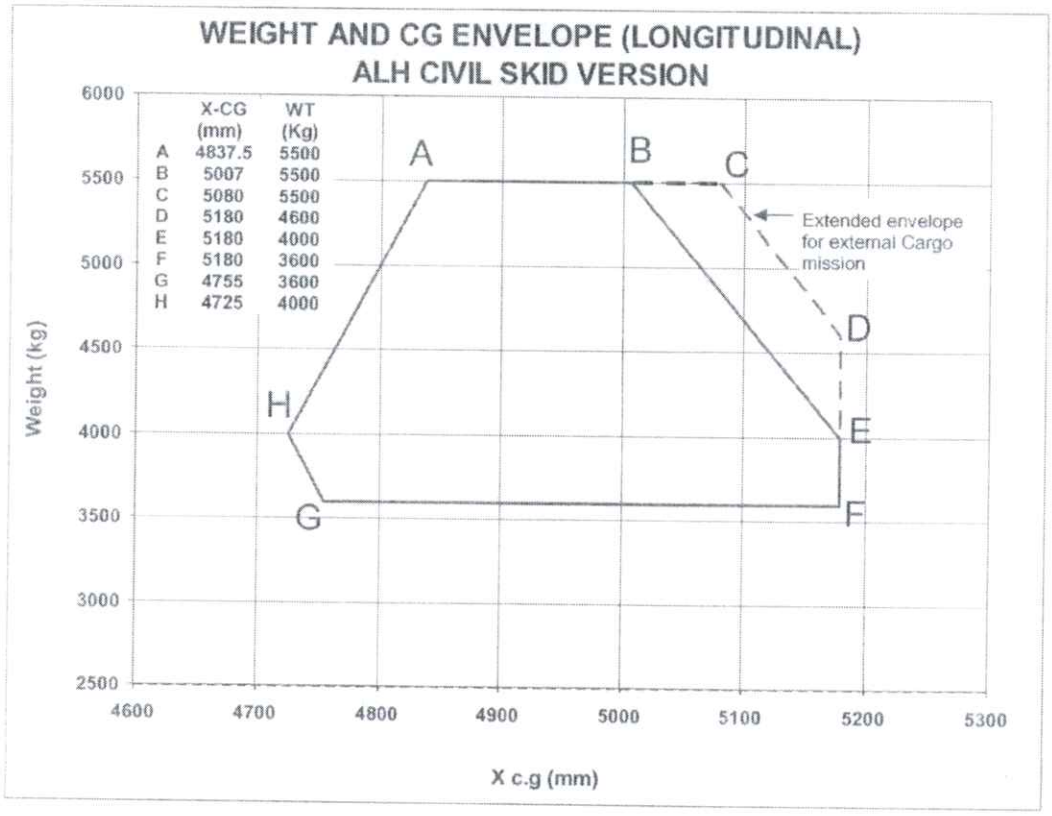
	Power Rating	MGB Torque Limit (Nm)
One Engine inoperative (OEI)		
Super Contingency – 30 Sec	1 x 800 Kw	1270
Max. Contingency – 2 min 30 Sec	1 x 700 Kw	1114
All Engine Operating (AEO)		
Take-Off (TOP) – 30 min	2 x 640 Kw	1014
Max. Continuous Power (MCP)	2 x 568 Kw	902

Airspeed Limits:

V_{NE} (Never Exceed) 155 Knots (IAS) at Sea Level at OAT of 20°C. (See Rotorcraft Flight Manual for variations of V_{NE} with gross weight and density altitude)

	Knots (IAS)
V_{NE} (Power – Off)	100
Max. Sideward (Nil wind condition)	27
Max. Rearward (Nil wind condition)	17
Max. speed with external cargo	55

Centre of Gravity Range The CG range for different weights is as shown below:



Empty Weight C.G Range	None.
Maximum Weight	Max. Cat A Take-off & landing weight at sea level : 5300 Kg Max. Cat B Take-off & landing weight at sea level : 5500 Kg
Maximum External Load	1500 Kg (see Note 5 on Maximum All Up Weight)
Maximum External Load for Rescue Hoist	250 Kg (see Note 5 on Maximum All Up Weight)
Minimum Flight Crew	2 pilots
Number of seats	Maximum 12 (excluding pilot seats)
Maximum Baggage	250 Kg (550 lbs) at + X6548 mm from datum. Floor Loading density = 600 Kg/Sq. M
Fuel Capacity	Usable : 1055 Kg Unusable : 8 Kg (See Note 1 for unusable fuel in empty weight CG range)
Oil Capacity	Capacity 7 Litres Critical 1.5 Litres

Max. Operating Altitude	Cruise: 20,000 feet pressure altitude (with AUW of 4500 Kg) and 14500 feet pressure altitude (with AUW of 5500 Kg) Hover: (IGE) 15,000 feet pressure altitude with AUW of 4000 Kg Cat-A take-off and landing: 10,600 feet pressure altitude for corresponding AUW (Refer flight manual) at ISA + 20°C Cat-B take-off and landing: 15,000 feet pressure altitude for corresponding AUW (Refer flight Manual) at ISA + 20°C.
Max. Operating Temperature	-30°C to +50°C
Production Basis	DHRUV (ALH) is manufactured by HAL, Bangalore under DGCA Approval Certificate No. DAW/BLR/CAR 21/POA/001, dated 25-11-2004.
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification basis) must be installed in the helicopter for certification.
Servicing Information	DGCA approved Rotorcraft Flight Manual ALH-CS-FM001, Master Servicing Recommendations and Master Minimum Equipment List.
Additional Conditions and Operating Limitations	All parts, components, instruments, equipment, avionics systems and associated software are parts of the type certified helicopter. Any non – conformance of these items with the approved design data and production process and / or any deviation from the Standard of Preparation (SOP) (Doc No. RC/ALH/SKID-CIVIL/DCD/SOP/001, Issue-I, Rev-B, dated 24-03-05) along with Modifications (MODs) and Service Bulletins (SBs) will require qualification testing and approval by DGCA for installation on the helicopter.
Certification Basis	➢ Type Certificate No. 5-8/96-RD-TC-1, dt. 30-07-04. Date of application: 12-01-2004. ➢ FAR-29, Amdt No. 1 through 47 as on 9th May 2001. ➢ CAR Section -II, Series I, Part II & Series O, Part IV. ➢ *Special Conditions*: High Intensity Radiated Fields (HIRF). (See Note 10 on HIRF) ➢ *Engine Certification Basis*: JAR – E Change 6 as on 28-08-1981.

- *Noise Certification Basis*: ICAO Annex – 16, Chapter 8.

- Equivalent Safety Findings (See Note 11 for Equivalent Level of Safety (ELOS) findings).

- Compliance with Ditching provisions of FAR 29.563, 29.563, 29.801, 29.807 (d), 29.1411, 29.1415 & 29.1561 have been complied. (See Note 7 on Icing limitations)

DATA PERTAINING TO ALL MODELS EXCEPT INDICATED

Certification Basis	DAR 08, Reglamento de Aeronavegabilidad. The certification basis imposed by the DGCA of India was accepted by the DGAC of Chile.
Production Basis	None. Before original airworthiness certification of each rotorcraft to be exported to Chile, a Chilean DGAC representative must perform a detailed inspection for workmanship, materials, conformity with the approved technical data, and a check of the flight characteristics. All materials incorporated in the rotorcraft other than those manufactured at HAL shall be supplied by vendors previously accepted by the DGAC, Chile.
Import Requirements	A DGCA of India Export Certificate for Airworthiness endorsed as noted under "Import Requirements" must be submitted for each individual rotorcraft for which application for a Chilean Certificate of Airworthiness is made. A Chilean Certificate of Airworthiness may be issued for new rotorcraft only on the basis of an DGCA of India Export Certificate of Airworthiness including the following statement: "The rotorcraft covered by this certificate has been inspected, tested and found to be in conformity with the approved type design as defined by the Chilean Type Certificate Validation Act N° H-A44-01/07 and it is in a condition for safe operation"
Datum	Reference datum is the station #0. It is located 5000 mm in front of the TPTO (Tail Power Take– off) point.
Leveling Means	As per procedure indicated in the Maintenance Manual.
Rotor Blade and Control Movement	Refer Rigging procedure as per Maintenance Manual.

NOTES:

Note 1: Current weight and balance report, including list of equipment included in certified empty weight, and loading instructions, when necessary, must be provided for each rotorcraft at the time of original certification. The certificated empty weight and corresponding C.G. locations must include un-drainable oil and unusable fuel.

See Rotorcraft Flight manual loading section for variations of fuel weight and moment-arm with variations of fuel and fuel quantity.

Note 2: The helicopter must be operated in accordance with the operating limitations specified in the approved Rotorcraft Flight Manual. All placards required in the Rotorcraft Flight Manual must be installed in the specified locations on the rotorcraft.

Note 3: Information essential to the proper maintenance of the rotorcraft is contained in the ALH Maintenance Manual and in the Master Servicing Recommendations. The values of retirement (service) life are contained in Master Servicing Recommendations.

Note 4: Use anti-icing additives for fuel temperatures less than or equal to +5°C. For details refer Turbomeca TM 333-2B2 Maintenance Manual.

Note 5: Maximum All Up Weight (AUW) of helicopter not to exceed 5500 Kg.

Note 6: Flights are permissible under DAY-NIGHT VFR and IFR conditions.

Note 7: Flight into known or anticipated icing or snow conditions prohibited.

Note 8: Helicopter to be operated in accordance with approved Rotorcraft Flight Manual.

Note 9: Helicopter and systems to be overhauled and maintained in compliance with the Maintenance Manual.

Note 10: HIRF as per AC 29.1309 paragraph (g) of AC 29-2C

Note 11: Equivalent Safety Findings:

1.	Flight & Navigation Instruments	29.1303 (a), (j)
2.	Flight Recorders	29.1459 (2)

LORENZO SEPULVEDA B.

JEFE DEPARTAMENTO
SEGURIDAD OPERACIONAL

JOSE HUEPE P.

DIRECTOR GENERAL
AERONAUTICA CIVIL