



Ministry of Defence



Ensuring an acceptable safety level for internal cargo loads and Helicopter Underslung Loads



Ministry of Defence

Military Aviation Authority the Netherlands (MAA-NLD)

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Objective for this briefing

Make you aware:

- How Helicopter Under Slung Loads (HUSL) and internal cargo loads are related to airworthiness
- Of the existence of a common regulatory framework as documented in existing NATO STANAGs
- That the NATO community could make use of the expertise, skills and tooling of the **Dutch Helicopter Loads Office** to test and clear HUSL and internal cargo loads, provided that the common regulatory framework will be used.



Agenda

- Background
- Regulatory framework in use in the Netherlands
- The Dutch Helicopter Loads Office (HLO)
 - History
 - Organization
 - Tasks
 - Clearance Process for HUSL and internal cargo loads
 - Contact HLO
- Conclusions



Background





Background

- Internal cargo loads affect the crashworthiness of the aircraft
 - Survivability of occupants
- Helicopter Under Slung Loads (HUSL) affect the aerodynamic properties of the helicopter
 - Leads to flight limitations
- Internal loads and HUSL which will be carried regularly need to be tested and cleared for a specific aircraft type before carrying these loads in the operational environment. Requirements for clearing those loads are documented in STANAGs.
 - Reaching an acceptable level of safety
 - Ensuring interoperability
- STANAGs document requirements:
 - for fixed wing transport aircraft and transport helicopters to enable them to carry internal loads and HUSL's in a safe way.
 - for the internal loads and HUSL and HUSL Equipment (HUSLE), in order to make sure that the loads are air transportable with an acceptable level of safety.
 - For testing and clearing HUSL
- Awareness that there are a few national organizations specialized in clearing HUSLE and HUSLs
 - Annex A of STANAG 2445: Criteria for the clearance of Helicopter Under Slung Load Equipment (HUSLE) and Under Slung Loads (USL)
 - Dutch Helicopter Loads Office



Regulatory framework in the Netherlands





Regulatory framework in use in the Netherlands

- **STANAG 3542:** Technical criteria for the transport of cargo by helicopter
- **STANAG 2445:** Criteria for the clearance of Helicopter Under Slung Load Equipment (HUSLE) and Under Slung Loads (USL)
- **STANAG 2286:** Technical criteria for external cargo carrying slings, nets and strops/pendants
- **STANAG 3400:** Restraint of cargo in fixed wing aircraft
- **NLD-SMAR-3:** Special Military Aviation Requirements for transportation of cargo in aircraft in connection with occupant safety
 - Additional to STANAG 3542 and 3400
 - More stringent load restraint factors for combi transport (cargo and occupants in the same cabin) in Ch-47, NH-90 and C-130.
 - Requirements for evacuation routes



The Dutch Helicopter Loads Office





History

- 1992: Formation of 11 Air Mobile Brigade
- 1993-1996: NLD Underslung Loads sent to the British Joint Air Delivery Test & Evaluation Unit (JADTEU) (GBR) for testing and clearing
- 1997: Setting up NLD External Load Office
- Copying the clearance procedures for HUSL from JADTEU
 - Interim phase from the 1st of June 1997 until the 1st of Jan 2000
- 2000: Producing HUSL Clearances and Regulations (VS 83-6700-001)
- 2011: Expansion tasks External Loads Office with Internal Loads.
Name change: **External Loads Office** to **Helicopter Loads Office**
- 2016: Expertise HLO also for Internal Load Clearances for fixed wing transport aircraft (C-130H and C-130H-30) in accordance with NLD-SMAR-3



Organization

- Defence Materiel Organization
 - Directorate Weapon Systems and agencies
 - › Aviation Systems Branch (Dutch MTCH Organization)
 - » Section Rotary Wing Aircraft
 - » HLO
- Formation
 - Head HLO: RNLAf Captain
 - Augmented by Subject Matter Experts of 11 Air Mobile Brigade / Defence Helicopter Command and Airbase Eindhoven
 - Total capacity: 5 FTE



Tasks HLO

- Testing and clearing HUSL and internal cargo loads for NLD armed Forces
- Advising and testing in relation to Helicopter Underslung Load Equipment (HUSLE)
- Participating / advising Uncleared (on time) Loads...
- National and International co-operation
 - Participant in NATO NSO HISWG
- Participation in Inquiry Committee related to HUSL accidents



Clearance Process for HUSL

- Load assessment
- Designing the Slinging scheme
- Determination of limitations
- Static test
- Flight test
- Final report
- Documentation of the clearance and published on MOD INTRA-net



Static Test



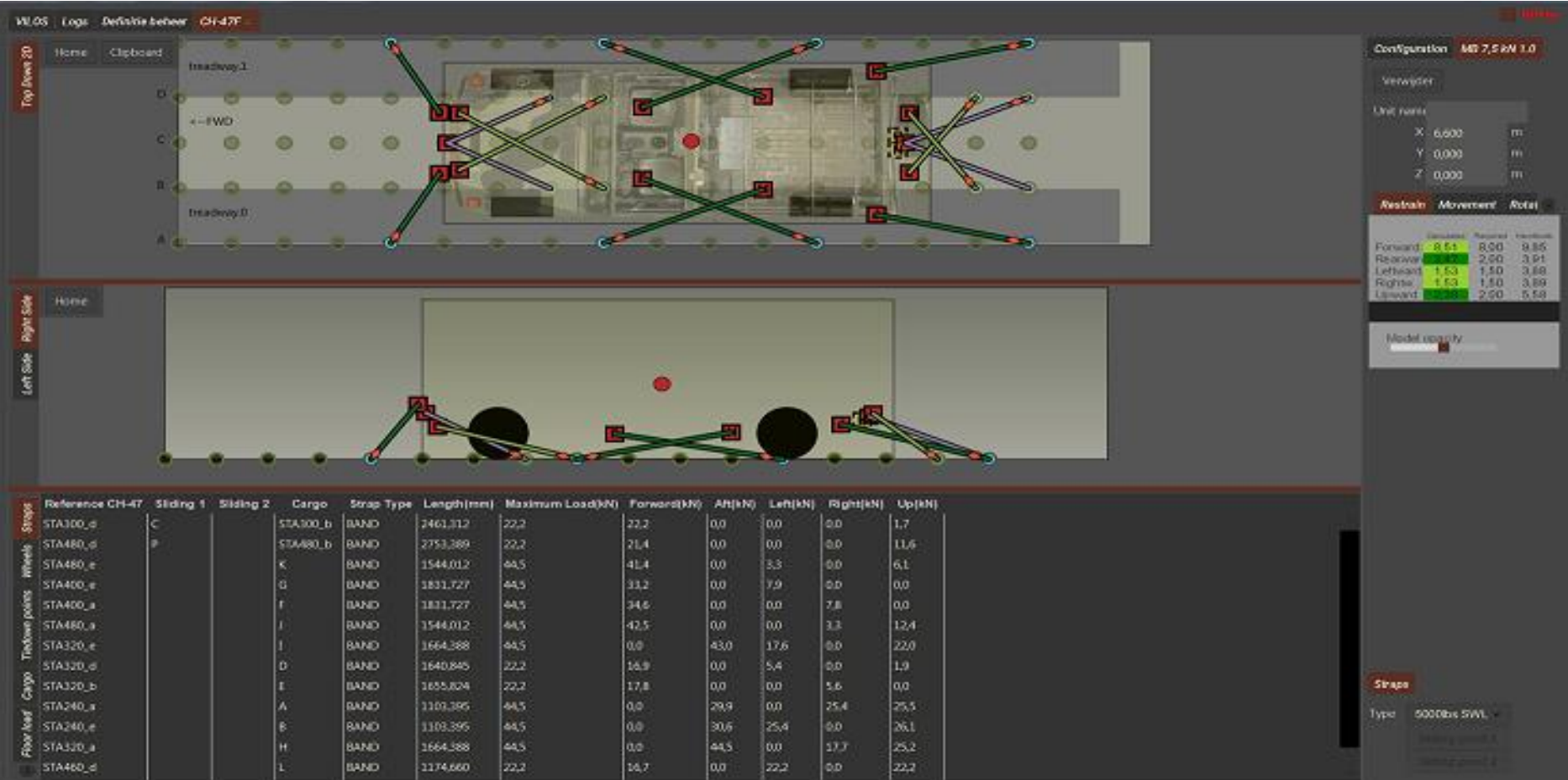


Clearance process for Internal Loads

- Measurement and weighing internal load
- Load assessment with software application VILOS
- Testing of rigging scheme on dummy floor
- Concept Tie-down scheme in aircraft
- Final report
- Documentation of the clearance and published on RNLAF Intranet Sharepoint



Use of software application VILOS to determine restraint factors



Rigging scheme on dummy floor



Documentation of the Internal Load Clearance



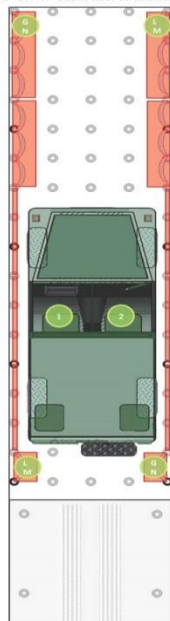
Koninklijke Luchtmacht
DHC

AANHANGSEL 1

MERCEDES 'G' WAGON 5 KN SOFTTOP



RNLAF CH-47 Cabin floor in combination with:



Helicopter ILC No
RNLAF 8002

WARNING:
YOU ARE TO BE TRAINED AND IN CURRENT PRACTICE WITH THE HILE EQUIPMENT. YOU SHOULD BE FAMILIAR WITH THE DESCRIPTIVE LITERATURE IN INSTR DMO 83-6700-001, VS 4-42, SMLE-2 AND SMLE-3

WEIGHT INFORMATION

Unladen:	2100 kg
Laden incl 2 pax (2x 100 kg)	2675 kg
CG unladen front axle +	54 inch
CG laden front axle +	68 inch

EQUIPMENT REQUIRED A/C - LOAD

- A/C: 10000 Lb Ratchetstrop (sapno SHTUULD05103) / Quantity: 14
- LOAD: Net, cargo restraint (sapno 10000259319), as req.
- 4020-99-701-7323 Nylon braided cord (NBC) 1200 lb SWL as reqd.

PREPARATION OF THE LOAD

- Remove antennas if fitted
- Fold the mirrors inward.
- Ensure fuel tank is less than 75% full.
- Secure all cargo inside the vehicle in accordance with restraint criteria.
- Ensure that 4 shackles are attached to the front/rear bumper.
- Drop the canopy frames to their lowest position.
- It is of no concern whether the canopy stays fitted or is removed.

PREPARATION OF THE AIRCRAFT

- No USL ops.
- Clear the loading area to floor level.
- Keep the treadways clear.
- Position and deploy ramp extensions.

LOADING

- Engage 4 wheel drive low ratio. Light switch set to position S1
- Approach helicopter only under strict guidance from loadmaster.
- On ground other than paved surfaces, pay special attention to the clearance between cabin and vehicle roof.
- Drive the vehicle up the ramp to its final position, guided by the loadmaster.
- Once the vehicle is in position, ensure handbrake is applied and select transmission in first gear.
- Shut down vehicle engine and switch battery off.
- Fasten the ratchetstrops according tie down scheme.

Note:

Unloading in reverse of loading

CARRIAGE OF DRIVER AND CO-DRIVER INSIDE THE VEHICLE DURING OPERATIONAL FLIGHTS

- The driver and co-driver must be briefed about brace positions and the emergency egress routes.
- The driver and co-driver must wear their seatbelts during flight.
- The windows of the doors must be fully turned down.

PAX

- 10 pax on 20 inch configuration 8 pax on 24 inch configuration.
- 6 pax on the floor using floorbelts.
- 2 pax in vehicle.

LEGEND

LM Indicates a position of loadmaster.

GN Indicates a position of gunner.

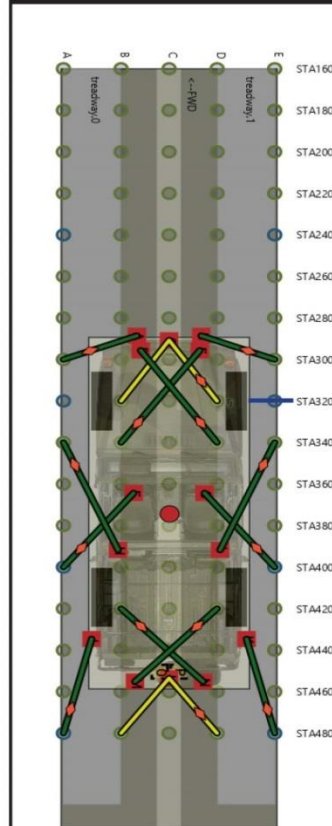
- 1 Indicates driver
- 2 Indicates co-driver



Koninklijke Luchtmacht
DHC

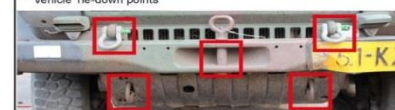
AANHANGSEL 1

MERCEDES 'G' WAGON 5 KN SOFTTOP



Helicopter ILC No
RNLAF 8002

Vehicle Tie-down points



Front



Rear



Side

LEGEND

- Indicates a 10000Lb ratchetstrop attached direct to cargo tie down point.
- Indicates a 10000Lb ratchetstrop looped around cargo tie down point.
- Indicates position of ratchet.





CONTACT HLO

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Conclusions

- Internal Loads and HUSL are strongly related to the Airworthiness of the aircraft carrying those loads
- It is of paramount interest to comply with the NATO regulatory framework for internal loads and HUSL to guarantee interoperability and efficient use of scarce expertise
- The Dutch HLO is specialized in clearance activities for internal loads and HUSL and is functionally controlled by the Dutch MTC Holder Organization
- HLO's expertise is also available for partner nations
 - Extending our capacity by partner nations Subject Matter Experts
 - Making use of facilities and tooling



Questions?