

COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS AND ON THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS

Sub-Committee of Experts on the
Transport of Dangerous Goods

Thirty-fourth session
Geneva, 1-9 December 2008
Item 4 of the provisional agenda

LISTING, CLASSIFICATION AND PACKING

Comments on ST/SG/AC.10/C.3/2008/70 by VOHMA

Submitted by the Portable Rechargeable Battery Association (PRBA),
RECHARGE and Battery Association of Japan (BAJ)

1. PRBA, RECHARGE and BAJ disagree with the proposal in VOHMA's document ST/SG/AC.10/C.3/2008/70 proposing to add a new proper shipping name for batteries. We have willingly agreed to the modification of SP 304 with respect to nickel-metal hydride batteries in an effort to prevent the placement of container loads of batteries adjacent to heated fuel tanks on container ships. In addition, PRBA, RECHARGE and BAJ members have reached out to nickel-metal hydride battery manufacturers world-wide to apprise them of the need to warn vessel operators against the placement of nickel-metal hydride cargoes adjacent to heated fuel tanks. However, PRBA, RECHARGE and BAJ consider the M/V Punjab Senator incident, first brought to the attention of the Sub-Committee by Germany in document ST/SG/AC.10/C.3/2007/45, highlights a vessel design oversight and not a dangerous goods issue.
2. By its proposal, VOHMA suggests that high temperatures experienced by cargoes placed adjacent to heated fuel oil tanks, which may raise surface temperatures of adjacent containers to 85°C, is a normal condition of transport. PRBA, RECHARGE and BAJ believe that this is not a normal condition – not even for a container vessel which may carry 2000 or more containers but where only a few container spaces may experience such intense heating.
3. The dangerous goods regulations are based on the assumption that 55°C is the maximum temperature. This is explicitly noted in the ICAO Technical Instructions which state:

“The extremes of temperature which may be encountered in international transportation are in the order of -40°C and 55°C.”.
4. This is also stated in 7.1.5.3.1.1 of the Model Regulations which in relation to temperature control requirements states:

“It is assumed that during transport the temperature of the immediate surroundings of the package does not exceed 55°C and attains this value for a relatively short time during each period of 24 hours.”.

5. This high temperature limit is based on container testing carried out in the desert by the US DOT. Temperature testing of containers carried out in the course of the MV Punjab Senator incident, in the vicinity of the equator, confirm that the 55°C temperature limit as being a conservative value.

6. BAJ conducted tests in 2005 and 2006 to determine what temperatures would be encountered by CTU and other packagings during transport in cargo vessel, aircraft and motor vehicles. Attached as Exhibit A are the data from those tests. They are consistent with the US DOT's container tests and the assumed temperatures identified in the Model Regulations and ICAO Technical Instructions.

7. An assumed maximum extreme temperature in the range of 55°C is fundamental to the UN Model Regulations as is evidenced by the use of temperature limits in this range. For example:

- (a) The upper flashpoint temperature limit for flammable liquids is based on a temperature of 60°C (see 2.3.2.6);
- (b) Classification of gases is based on the vapor pressure at 50°C (see 2.2.1.1(a));
- (c) Classification of self heating substances is based on the ability of a substance to undergo spontaneous combustion at a temperature of 50°C or less (see 33.3.1.3.3.1 of the Manual of Tests and Criteria);
- (d) Criteria for organic peroxides and self reactive substances exempt substances from regulation if the SADT exceeds 75°C (see for example 2.4.2.3.1.1(e)) and requirements for temperature control for self reactive substances are based on whether the SADT is less than or equal to 55°C (see 2.4.2.3.4); and
- (e) Packagings are required to be resistant to the total gauge pressure that will develop at a temperature of 55°C (see 4.1.1.10(a)).

8. PRBA, RECHARGE and BAJ believe the dangers posed by placing containers adjacent to heated fuel tanks extend well beyond the issue of nickel-metal hydride batteries. Recalling incidents involving calcium hypochlorite, PRBA, RECHARGE and BAJ are well aware of other vessel incidents where dangerous goods have reacted dangerously when placed adjacent to heated fuel tanks onboard vessels. Under the conditions existing on the M/V Punjab Senator, it is evident that nondangerous goods could also respond dangerously. For example:

- (a) A non dangerous liquid with a flashpoint greater than 60°C when exposed to a temperature of 85°C could produce a vapor pressure sufficient to rupture its packaging and release flammable vapors into a cargo hold, potentially resulting in a fire and explosion if an ignition source is present;

- (b) An organic peroxide or other non dangerous substance that self reacts exothermically at a temperature greater than 75°C when exposed to a temperature of 85°C could self react dangerously; and
- (c) A non dangerous substance with self heating properties could be heated to a temperature above 50°C where it begins to self heat uncontrollably and experience spontaneous combustion.

9. Vessel operators in randomly placing containers of non dangerous goods adjacent to heated fuel tanks, place their vessels and their crews in danger. PRBA, RECHARGE and BAJ believe that the potential dangers identified warrant further action. We recommend that the United Nations Committee at the earliest possible opportunity advise the International Maritime Organization:

- (a) That the UN Model Regulations are based on an assumed maximum temperature extreme on the order of 55°C and that the Model Regulations do not account for the abnormally high temperatures vessel operators may expose some containers to when they place them adjacent to heated fuel tanks;
 - (b) That as demonstrated in at least one incident there are substances not subject to the UN Model Regulations that could react dangerously when in containers placed adjacent to heated fuel compartments of container ships and it is likely that there are many others; and
 - (c) That IMO takes steps such as the issuance of an IMO Circular letter advising container vessel operators worldwide of the potential danger for their vessels and crews when randomly placing unscreened containers adjacent to such spaces; and
 - (d) That vessel operators should be advised to take immediate action to screen container cargoes before placing them adjacent to fuel compartments undergoing heating in excess of 55°C.
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EXHIBIT A

to PRBA, RECHARGE and BAJ
Informal UN Paper

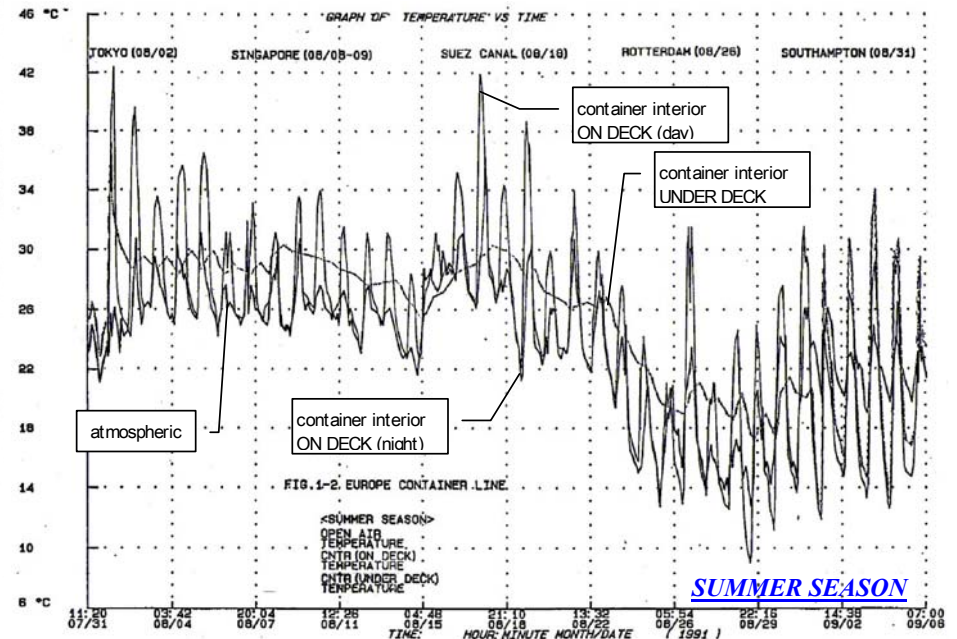
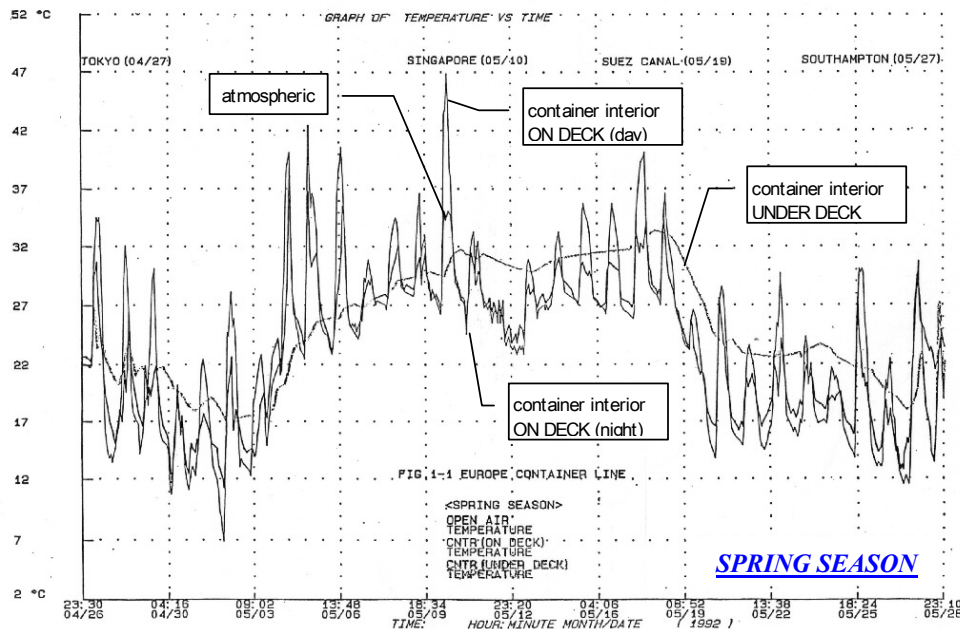
November 2008

Ni-MH Battery Transportation Shipping data

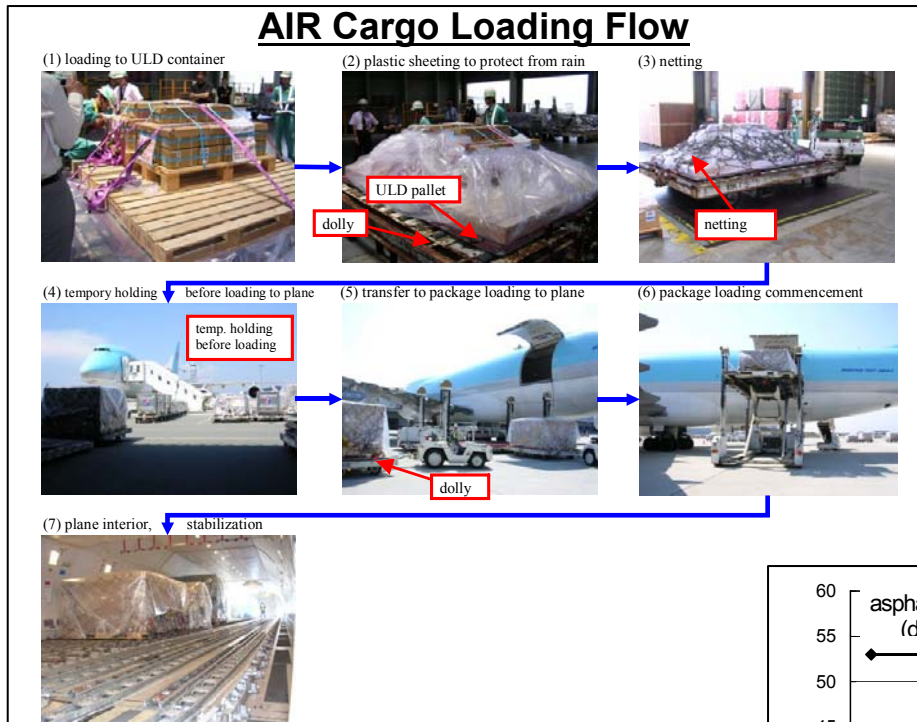
Investigation into CTU temperatures during sea transport

The following shows data for thermal measurements taken for the dry container cargo of a sea shipment from **Japan (Tokyo)** to **England (Southampton)** via a **European sea** shipment route.

Temperatures within containers **ON DECK** reached a max. temp. of approximately **47deg.C** during the day, showing a wide range of temperature variation for day—night-time measurements. Temperatures **UNDER DECK**, on the other hand, reached max temp. of **34deg.C**, not showing as much of a range from day—night-time temperature variations.



Investigation into CTU temperatures during air transport



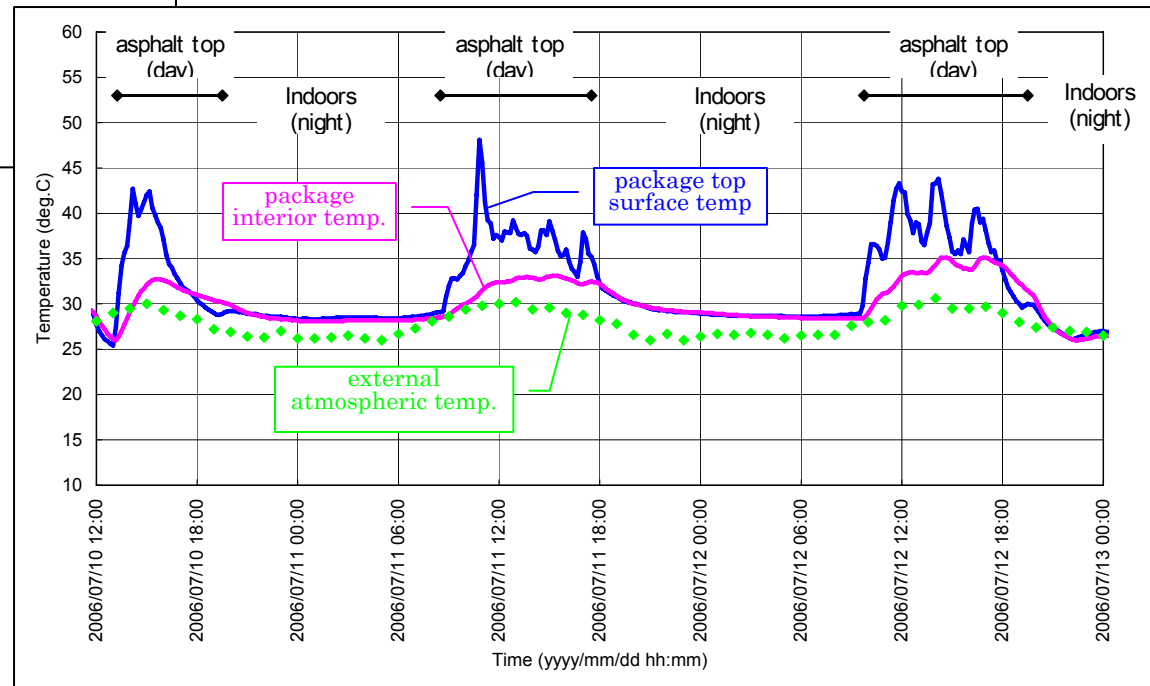
Cargo for AIR Shipments are handled as shown in the following flow:

Of particular import is point (4), where the cargo is temporarily held on the tarmac for temporary holding, where temperatures may reach highest possible conditions being exposed to direct sunlight.

(7) is not shown as temperatures in the cargo hold after takeoff are generally very low.

In order to determine the road surface temperature of the tarmac, we measured the temperatures of a package placed on the asphalt surface of a tarmac at Kansai International Airport. The top surface of the package reached a max temperature of app. **48deg.C**.

Thermo-recorder

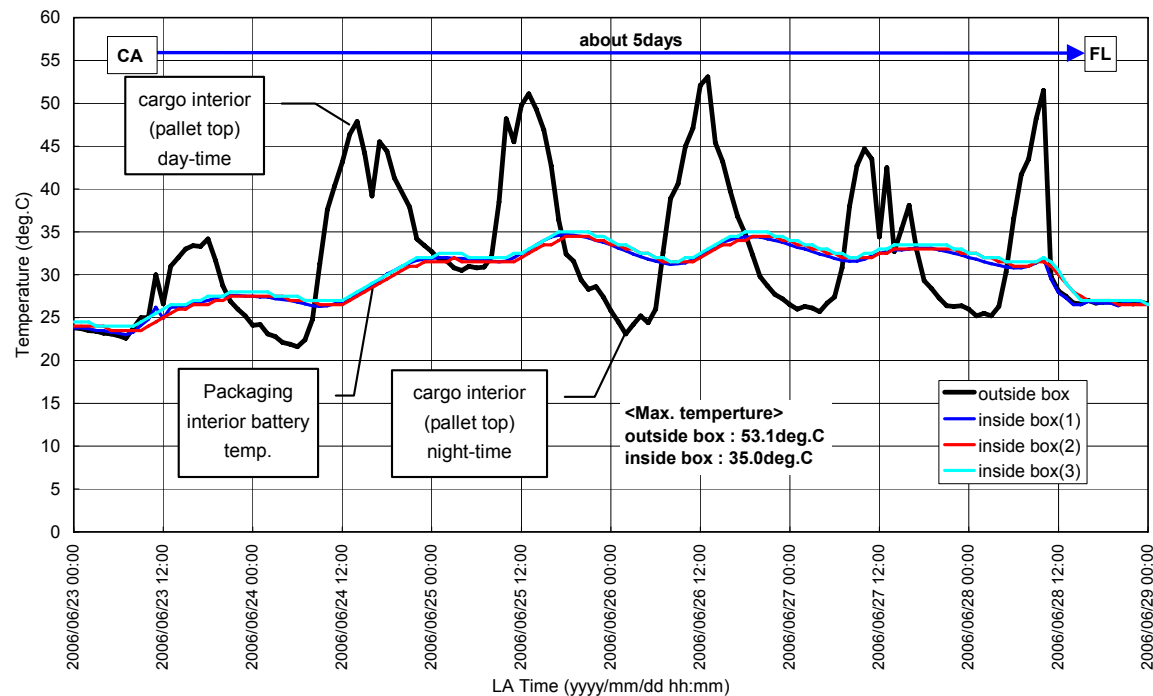
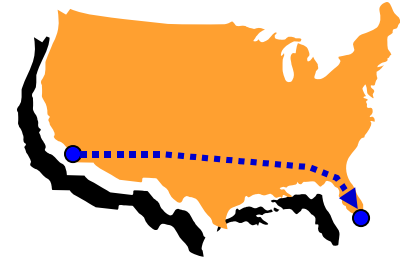


Investigation into CTU temperatures during land transport

Thermal measurements were taken for the cargo of a **truck shipment** across America.

A **thermo-recorder** was attached both on top of the pallet (to measure temperatures in the cargo hold of the truck) and in the packaging of the batteries, and the route was from the **west coast (CA)** to the **east coast (FL)**.

The cargo hold (pallet top) **reached a max temp. of 53deg.C**, and the range was approximately 20deg.C night-time temperature to 55deg.C day-time temperature.



Thermo-recorder

