Brief Description of the CTX Casualty Database

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1 Synopsis

The Center for Tankship Excellence Casualty Data Base (CDB) is a free, public, open source data base of tanker and bulk carrier casualties. It was designed to avoid the defects of existing marine casualty data bases almost all of which are proprietary, un-auditable, inflexible, attempt to divide casualties into overlapping categories, confuse cause and effect, and/or fail to record any real causal information.

For the CTX CDB, a casualty is simply a sequence of events. A casualty is not a collision, although it may contain one or more collision events. A casualty is not a grounding, although it may contain one or more grounding events. A casualty is not a fire/explosion although it may contain one or more conflagration events. And so on. A casualty may contain any combination of structural failure/damage events, machinery failure/damage events, attacks, bridge events (such as course, speed alterations), response events (such as coastal stage provision/denial of refuge), and many more including collisions, groundings, and fires.

In the CTX CDB, a casualty is NOT bound to a ship. Rather ships are bound to events. Each event may have one or more actors associated with it. In almost all cases, the actor is a ship, but an actor may also be a terminal, an offshore platform, or any other entity that plays an important role in the event.

Causality is handled at the event level. Each event may fall into exactly one of the following cause categories:

Necessary Cause Each casualty must have one or more necessary causes. A necessary cause is an error or defect or failure which, if had not happened, then with high probability the casualty would have been averted. Exactly one of the necessary causes is designated the primary cause.

Secondary Cause A secondary cause is an error or defect or failure which, if it had not happened, then with high probability the casualty would have been mitigated. Poor or non-existent inerting is a common example. A casualty may have zero or more secondary causes.

Non-causal The event is a consequence, not a cause. Collisions, groundings, and fires among others are consequences not causes.
The treatment of causality does three things:
1. It allows multiple causality, a commonplace in most casualties.
2. It separates the necessarily subjective cause assignment from the more factual data. The CTX CDB can be used by people who disagree with the coder’s cause assignments.
3. It avoids confusing cause with effect.

The CTX CDB is an XML format. This accomplishes at least four goals:
1. The hierarchical nature of XML allows an unlimited set of fields, and sub-fields, and sub-sub-fields. This is in sharp contrast to tabular arrangements, including spreadsheets, in which the number of columns is fixed. This in turn forces coders into either/or decisions. Either the casualty is a collision or grounding or whatever when in fact a casualty may involve any combination of such events.
2. The data is human readable, and self-identifying. Figure 1 and 3 show a couple of examples. Even without consulting the manual, it is easy to guess what most of the fields are. The raw CTX data can be inspected by anyone with a browser or a general purpose editor. No specialized software is required to view all the information in the database. Unlike relational databases, all the data on a particular casualty is localized in one place. Simply point your browser at the CDB core file. The CTX CDB is truly auditable.
3. As Figures 1 and 3 hint, The CTX CDB is capable of recording a casualty in considerable detail. The goal is to allow complete analysis of the casualty including flooding, spillage, and residual strength. However, in most cases, we have very little information on a casualty, especially just after the casualty has occurred. The hierarchical nature of XML makes it easy to include the data when we have it, but allows us to not include it if we don’t.
4. XML allows the database to be easily expanded. New fields and new elements can be added without affecting existing code.

Each casualty in the CDB is supported by a precis file. This file contains text descriptions of the casualty from whatever sources we have been able to locate — including sources CTX may disagree with — and/or links to other sites that have descriptions of the casualty, the most important of which are usually the coastal state investigation reports. The precis file allows anyone to see what the CDB entry for that casualty is based on.

These precis files in turn are supported by a pics folder for each casualty which contains whatever photos, drawing and charts we have been able to obtain relevant to the casualty.

The CTX CDB currently contains about 1650 tanker and bulk carrier casualties. It can be downloaded in its raw form from www.c4tx.org/ctx/job/cdb/ctx_coresort.zip. It can also be accessed via a browser at www.c4tx.org/ctx/job/cdb/flex.html. Be aware that the browser interface allows only the simplest of queries. The draft manual can be viewed at www.c4tx.org/ctx/pub/cdb_man.pdf. The paper Uses and Abuses of Ship casualty Data at www.c4tx.org/ctx/pub/cas_data.pdf contains a critique of existing casualty databases and the motivation behind the design of the CTX CDB.

Currently, the CTX CDB contains only tanker and bulk carrier casualties. However, it could very easily be expanded to handle other types of ships.

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1 XML is also not only machine readable but an open and nearly universal standard. Powerful software tools exist — many of them Open Source — which make it easy to query, aggregate, and analyse XML data.
Figure 1: Sample casualty involving a grounding (cont. on next page)
Steel: 3500 tons, ref=ntsb91, fig 8, height numbers look optimistic

Note: 160m long damage, 8 of 11 cargo tanks holed, 41000m3 spill.

Note: ntsb way low in this tank, damage extended past cl.

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Figure 2: Sample casualty involving a grounding
Figure 3: Sample casualty involving an allision