
Stage three: #164 Redesign < hazardstatement>

Redesign the hazard statement domain to better support current standards, authoring requirements, and rendering requirements.

Champion

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Tracking information

Event	Date	Links
Stage 1 proposal accepted	20 August 2019	Minutes
Stage 2 proposal submitted	16 September 2019	DITA PDF
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Stage 2 proposal approved	01 October 2019	Minutes
Stage 3 proposal submitted to reviewers	01 October 2019	Bill Burns, Healthwise Eliot Kimber, Individual member
Stage 3 proposal (this document) submitted to TC		DITA PDF

Approved technical requirements

- Restrict the values of the @type attribute on <hazardstatement> to danger, caution, warning, notice, and -dita-use-conref-target
- Require the @type attribute on <hazardstatement>
- Improve the element-reference topic for <hazardstatement> to include definitions of the values for the @type attribute that match those in the ANSI Z535.6 standard. The following definition descriptions are taken verbatim from ANSI Z535.6:

DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

Note that the DITA spec will not use these definitions verbatim. They will be edited to match our style guidelines.

- Expand the content model of `<messagepanel>` to enable greater flexibility in the order of the child elements. While `<typeofhazard>` will remain required and the first child of `<messagepanel>`, it now can be followed by either of the following:
 - `<consequence>` (zero or more), `<howtoavoid>` (one or more)
 - `<howtoavoid>` (one or more), `<consequence>` (zero or more)
- Expand the content model of `<howtoavoid>` to permit `` and ``, in addition to `<sl>`
- Change the specialization base of `<messagepanel>`, `<typeofhazard>`, `<consequence>`, and `<howtoavoid>` to `<div>`
- Add `<hazardsymbol>` to the content models of `<messagepanel>`, `<typeofhazard>`, `<consequence>`, and `<howtoavoid>`
- Remove `<hazardsymbol>` from the content model of `<hazardstatement>`

Dependencies or interrelated proposals

None

Modified grammar files

The following files must be modified:

- (DTD) `hazardstatementDomain.mod`
- (RNG) `hazardstatementDomain.rng`

In the content below, the following conventions are used:

- Bold is used to indicate code to be added, for example, **addition**.
- Line-through and red text is used to indicate code to be removed, for example, ~~removal~~.
- Ellipses (...) indicate where code is snipped for brevity.

Figure 1: Changes to `hazardstatementDomain.mod`

```

...
<!-- ===== -->
<!-- ELEMENT DECLARATIONS -->
<!-- ===== -->

<!-- ENTITY % hazard.ent
-----
      "#PCDATA" +
-----
      %basic.ph; +
-----
      %sl; +
-----
      %simpletable;"
>
<!-- LONG NAME: Hazard Statement -->
<!-- ENTITY % hazardstatement.content
-----
      "({%messagepanel;})+,
-----
      (%hazardsymbol;*)"
-----
      "({%messagepanel;})+"
>
<!-- ENTITY % hazardstatement.attributes
-----
      "type
-----
      (attention+
      caution |
      danger |
      fastpath+
-----
      important+
-----
      note +
      notice |
      other +
-----
      remember +
-----
      restriction +
-----
      tip +

```

```

warning |
-dita-use-conref-target)
#IMPLIED
#REQUIRED
spectitle
CDATA
#IMPLIED
othertype
CDATA
#IMPLIED
%univ-atts;
outputclass
CDATA
#IMPLIED"
>
...
<!-- LONG NAME: Hazard Message panel -->
<!ENTITY % messagepanel.content
"(%data; |
%data-about;)*,
(%typeofhazard;)*,
(%consequence;)*,
(%howtoavoid;)+)"
" (
(%data; | %data-about;)*,
(%typeofhazard;),
(
((%consequence;)*, (%howtoavoid;)+) |
((%howtoavoid;)+, (%consequence;)*
), (%hazardsymbol;)*
)"
>
...
<!-- LONG NAME: The Type of Hazard -->
<!ENTITY % typeofhazard.content
"(%words.ent; |
%ph; |
%tm;)*"
"(%words.cnt; |
%ph; |
%tm; |
%hazardsymbol;)*"
>
...
<!-- LONG NAME: Consequences of not Avoiding the Hazard -->
<!ENTITY % consequence.content
"(%words.ent; |
%ph; |
%tm;)*"
"(%words.cnt; |
%ph; |
%tm; |
%hazardsymbol;)*"
>
<!-- LONG NAME: How to Avoid the Hazard -->
<!ENTITY % howtoavoid.content
"(%hazard.ent;)*"
" (#PCDATA |
%basic.ph; |
%sl; |
%ul; |
%ol; |
%simpletable; |
%hazardsymbol;)*"
>
>
>
...
<!-- ===== -->
<!-- SPECIALIZATION ATTRIBUTE DECLARATIONS -->
<!-- ===== -->

<!ATTLIST hazardstatement class CDATA "+ topic/note hazard-d/hazardstatement ">
<del>!ATTLIST messagepanel class CDATA "+ topic/ul hazard-d/messagepanel ">

```

```

<!ATTLIST messagepanel class CDATA "+ topic/div hazard-d/messagepanel ">
<!ATTLIST hazardsymbol class CDATA "+ topic/image hazard-d/hazardsymbol ">
<del>!ATTLIST typeofhazard class CDATA "+ topic/li hazard-d/typeofhazard ">
<del>!ATTLIST consequence class CDATA "+ topic/li hazard-d/consequence ">
<del>!ATTLIST howtoavoid class CDATA "+ topic/li hazard-d/howtoavoid ">
<!ATTLIST typeofhazard class CDATA "+ topic/div hazard-d/typeofhazard ">
<!ATTLIST consequence class CDATA "+ topic/div hazard-d/consequence ">
<!ATTLIST howtoavoid class CDATA "+ topic/div hazard-d/howtoavoid ">

```

Figure 2: Changes to hazardstatementDomain.rng

```

...
<div>
  <a:documentation>Define elements content and attributes</a:documentation>

  <del>
    <define name="hazard.ent">
      <choice>
        <text/>
        <ref name="basic.ph"/>
        <ref name="sl"/>
        <ref name="simpletable"/>
      </choice>
    </define>
  </del>

  <div>
    <a:documentation>LONG NAME: Hazard Statement</a:documentation>
    <define name="hazardstatement.content">
      <oneOrMore>
        <ref name="messagepanel"/>
      </oneOrMore>
      <del>
        <zeroOrMore>
          <ref name="hazardsymbol"/>
        </zeroOrMore>
      </del>
    </define>
    <define name="hazardstatement.attributes" >optional>
      <del>
        <attribute name="type">
          <choice>
            <value>attention</value>
            <value>caution</value>
            <value>danger</value>
            <value>fastpath</value>
            <value>important</value>
            <value>note</value>
            <value>notice</value>
            <value>other</value>
            <value>remember</value>
            <value>restriction</value>
            <value>tip</value>
            <value>warning</value>
            <value>-dita-use-conref-target</value>
          </choice>
        </attribute>
      </del>
      <attribute name="type">
        <choice>
          <value>caution</value>
          <value>danger</value>
          <value>notice</value>
          <value>warning</value>
          <value>-dita-use-conref-target</value>
        </choice>
      </attribute>
    </optional>
    <optional>
      <attribute name="spectitle"/>
    </optional>
    <del>
      <optional>
        <attribute name="othertype"/>
      </optional>
    </del>
    <ref name="univ-atts"/>
  </define>
  ...
</div>
<a:documentation>LONG NAME: Hazard Message panel</a:documentation>

```

```

<define name="messagepanel.content">
  <zeroOrMore dita:since="1.3">
    <choice>
      <ref name="data"/>
      <ref name="data-about"/>
    </choice>
  </zeroOrMore>
  <ref name="typeofhazard"/>
  <zeroOrMore>
    <ref name="consequence"/>
  </zeroOrMore>
  <oneOrMore>
    <ref name="howtoavoid"/>
  </oneOrMore>
  <group>
    <zeroOrMore>
      <choice>
        <ref name="data"/>
        <ref name="data-about"/>
      </choice>
    </zeroOrMore>
    <ref name="typeofhazard"/>
    <choice>
      <group>
        <zeroOrMore>
          <ref name="consequence"/>
        </zeroOrMore>
        <oneOrMore>
          <ref name="howtoavoid"/>
        </oneOrMore>
      </group>
      <group>
        <oneOrMore>
          <ref name="howtoavoid"/>
        </oneOrMore>
        <zeroOrMore>
          <ref name="consequence"/>
        </zeroOrMore>
      </group>
    </choice>
  </zeroOrMore>
  <ref name="hazardsymbol"/>
</zeroOrMore>
</group>
</define>
...
<div>
  <a:documentation>LONG NAME: The Type of Hazard</a:documentation>
  <define name="typeofhazard.content">
    <zeroOrMore>
      <choice>
        <ref name="words.cnt"/>
        <ref name="ph"/>
        <ref name="tm"/>
        <ref name="hazardsymbol"/>
      </choice>
    </zeroOrMore>
  </define>
...
<div>
  <a:documentation>LONG NAME: Consequences of not Avoiding the Hazard</a:documentation>
  <define name="consequence.content">
    <zeroOrMore>
      <choice>
        <ref name="words.cnt"/>
        <ref name="ph"/>
        <ref name="tm"/>
        <ref name="hazardsymbol"/>
      </choice>
    </zeroOrMore>
  </define>
...
<div>
  <a:documentation>LONG NAME: How to Avoid the Hazard</a:documentation>

```

```

<define name="howtoavoid.content">
  <zeroOrMore>
    <ref name="hazard.ent"/>
  </zeroOrMore>
  <zeroOrMore>
    <choice>
      <text/>
      <ref name="basic.ph"/>
      <ref name="sl"/>
      <ref name="ol"/>
      <ref name="ul"/>
      <ref name="simpletable"/>
      <ref name="hazardsymbol"/>
    </choice>
  </zeroOrMore>
</define>
...
<div>
  <a:documentation>Specialization attributes. Global attributes and class
  defaults</a:documentation>

  <define name="hazardstatement.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/note hazard-d/hazardstatement" />
    </optional>
  </define>
  <define name="messagepanel.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/ul hazard-d/messagepanel" />
      <attribute name="class" a:defaultValue="+ topic/div hazard-d/messagepanel" />
    </optional>
  </define>
  <define name="hazardsymbol.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/image hazard-d/hazardsymbol" />
    </optional>
  </define>
  <define name="typeofhazard.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/li hazard-d/typeofhazard" />
      <attribute name="class" a:defaultValue="+ topic/div hazard-d/typeofhazard" />
    </optional>
  </define>
  <define name="consequence.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/li hazard-d/consequence" />
      <attribute name="class" a:defaultValue="+ topic/div hazard-d/consequence" />
    </optional>
  </define>
  <define name="howtoavoid.attlist" combine="interleave">
    <optional>
      <attribute name="class" a:defaultValue="+ topic/li hazard-d/howtoavoid" />
      <attribute name="class" a:defaultValue="+ topic/div hazard-d/howtoavoid" />
    </optional>
  </define>
</div>

```

Modified terminology

None

Modified specification documentation

Note All numeric references here are to the DITA 2.0 specification, [working draft 11](#).

The following table contains precise suggestions for changes to be made to topics. Deletions are indicated with line through and red text, for example, ~~deletion~~.

Topic	DITA 2.0, working draft 11 content	New content
10.6.2.1 <consequence>	<p>Specialization hierarchy</p> <p>The <consequence> element is specialized from <u1>. It is defined in the hazard-statement domain module.</p>	<p>Specialization hierarchy</p> <p>The <consequence> element is specialized from <div>. It is defined in the hazard-statement domain module.</p>
10.6.2.2 <hazardstatement>	<p>Attributes</p> <p>The following attributes are available on this element: and , and the attributes defined below.</p> <p>@type</p> <p>Describes the level of hazard. Safety hazard level definitions correspond to the same values in the ANSI Z535 and the ISO 3864 standards. Note that this differs from the @type attribute on many other DITA elements. See for detailed information on supported values and processing implications. Available values are note, tip, fastpath, restriction, important, remember, attention, caution, notice, danger, warning, other, and -dita-use-conref-target.</p> <p>@othertype</p> <p>Indicates an alternate note type, when the type is not available in the @type attribute value list. This value is used as the user-provided note title when the @type attribute value is set to "other."</p>	<p>Attributes</p> <p>The following attributes are available on this element: and , and the attributes defined below.</p> <p>@type</p> <p>Indicates the level of hazard. The values correspond to the signal words defined by the ANSI Z535.6 standard:</p> <p>caution</p> <p>Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.</p> <p>danger</p> <p>Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.</p> <p>notice</p> <p>Indicates information considered important but not hazard-related, for example, messages relating to property damage.</p> <p>warning</p> <p>Indicates a hazardous situation that, if not avoided, could result in death or serious injury.</p> <p>-dita-use-conref-target</p> <p>See for more information.</p>
10.6.2.3 <hazardsymbol>	Not applicable	<p>Usage information</p> <p>When a <hazardsymbol> element is directly contained by <messagepanel>, the <hazardsymbol> is assumed to be associated with the <typeofhazard> element.</p>

Topic	DITA 2.0, working draft 11 content	New content
10.6.2.4 <howtoavoid>	Specialization hierarchy The <howtoavoid> element is specialized from . It is defined in the hazard-statement domain module.	Specialization hierarchy The <howtoavoid> element is specialized from <div>. It is defined in the hazard-statement domain module.
10.6.2.5 <messagepanel>	Specialization hierarchy The <messagepanel> element is specialized from . It is defined in the hazard-statement domain module.	Specialization hierarchy The <messagepanel> element is specialized from <div>. It is defined in the hazard-statement domain module.
10.6.2.6 <typeofhazard>	Specialization hierarchy The <typeofhazard> element is specialized from . It is defined in the hazard-statement domain module.	Specialization hierarchy The <typeofhazard> element is specialized from <div>. It is defined in the hazard-statement domain module.

The following figures contains new content for the examples in the hazard-statement domain topics.

Figure 3: Changes to <consequence> example

In the following code sample, a hazard statement is assigned a "caution" signal word. The hazard image is explicitly associated with the type of hazard.

```
<hazardstatement type="caution">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol href="hotsurface.png"/>
      HOT SURFACES
    </typeofhazard>
    <consequence>Contact may cause a burn.</consequence>
    <howtoavoid>Wear gloves before servicing internal parts.</howtoavoid>
  </messagepanel>
</hazardstatement>
```

Figure 4: Changes to <hazardstatement> example

The following code sample defines a hazard statement with a signal word of "DANGER."

```
<hazardstatement type="danger">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol href="rotatingblade.png"/>
      Rotating blade</typeofhazard>
      <consequence>Moving parts can crush and cut.</consequence>
      <howtoavoid>Follow lockout procedure before servicing.</howtoavoid>
    </messagepanel>
  </hazardstatement>
```

Figure 5: Changes to <hazardsymbol> example

The following code sample defines a hazard statement with a signal word of "DANGER." The <hazardsymbol> element is explicitly associated with the <typeofhazard> element.

```
<hazardstatement type="danger">
  <messagepanel>
```



```

<typeofhazard>
  <hazardsymbol href="rotatingblade.png"/>
  Rotating blade</typeofhazard>
  <consequence>Moving parts can crush and cut.</consequence>
  <howtoavoid>Follow lockout procedure before servicing.</howtoavoid>
</messagepanel>
</hazardstatement>

```

In the following code sample, the `<hazardsymbol>` is contained by the `<messagepanel>` element. By default, this markup also associates the `<hazardsymbol>` element with the `<typeofhazard>` element. This markup can be useful when migrating hazard statements from earlier versions to DITA 2.0.

```

<hazardstatement type="danger">
  <messagepanel>
    <typeofhazard>Rotating blade</typeofhazard>
    <consequence>Moving parts can crush and cut.</consequence>
    <howtoavoid>Follow lockout procedure before servicing.</howtoavoid>
    <hazardsymbol href="rotatingblade.png"/>
  </messagepanel>
</hazardstatement>

```

Figure 6: Changes to `<howtoavoid>` example

The following code sample illustrates a hazard statement with the signal word of "notice", which is reserved for situations that only involve possible property damage or other undesirable states. The `<howtoavoid>` element provides instructions about how to avoid the undesirable state.

```

<hazardstatement type="notice">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol href="agressivesolvent.png"/>
      Machinery Damage</typeofhazard>
    <howtoavoid>
      <hazardsymbol href="readmanual.png"/>
      <ul>
        <li>Do NOT use solvents to clean the drum surface</sli>
        <li>Read manual for proper drum cleaning procedure</sli>
      </ul>
    </howtoavoid>
  </messagepanel>
</hazardstatement>

```

Figure 7: Changes to `<messagepanel>` example

The following code sample generates an ANSI X 535.6 grouped safety message that specifies information about multiple hazards.

```

<hazardstatement type="warning">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol keyref="electric-shock-hazard"/>
      ELECTRIC SHOCK HAZARD</typeofhazard>
      <consequence>The equipment must be grounded. Improper grounding, setup, or usage of
        the system can cause electric shock
      </consequence>
      <howtoavoid>
        <hazardsymbol keyref="ground-power-source"/>
        <ul>
          <li>Turn off and disconnect power at main switch before disconnecting any
            cables or before servicing or installing any equipment.</li>
          <li>Connect only to grounded power sources.</li>
          <li>All electric wiring must be done by a qualified electrician and comply
            with all local codes and regulations.</li>
        </ul>
      </howtoavoid>
    </messagepanel>
    ...

```

```

<messagepanel>
  <typeofhazard>
    <hazardsymbol keyref="burn-hazard"/>
    BURN HAZARD</typeofhazard>
    <consequence>Electric surfaces and fluid can become very hot during
      operation.</consequence>
    <howtoavoid>
      To avoid burns:
      <ul>
        <li>Do not touch hot fluid or equipment.</li>
      </ul>
    </howtoavoid>
  </messagepanel>
</hazardstatement>

```

Figure 8: Changes to <typeofhazard> example

The following code sample generate a "Caution" hazard statement, which warns users against lifting heavy objects without referring to the product safety manual.

```

<hazardstatement type="caution">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol href="heavy-object.png"/>
      Lifting hazard
    </typeofhazard>
    <consequence>May result in injury.</consequence>
    <howtoavoid>See safety manual for lifting instructions.</howtoavoid>
  </messagepanel>
</hazardstatement>

```

Migration plans for backwards incompatibilities

This proposal contains three backwards-incompatible changes:

- Making the @type attribute on <hazardstatement> required
- Removal of certain values for the @type attribute on <hazardstatement>
- Removal of <hazardsymbol> from the content model of <hazardstatement>

While search or utilities can be used to locate <hazardstatement> elements that need to be migrated to DITA 2.0, the content and images referenced by the <hazardsymbol> element will need to be examined in order to determine how to rework the hazard statement for DITA 2.0.

The following table outlines a basic strategy for migrating existing hazard statements to DITA 2.0.

Backwards-incompatible change	Migration approach
<hazardstatement> elements without a @type attribute	<ol style="list-style-type: none"> 1. Search DITA source to locate <hazardstatement> elements that do not have a @type attribute. 2. If such elements exist, either assign a @type attribute or change the <hazardstatement> element to a <note>.
Removed values for @type on <hazardstatement>	<ol style="list-style-type: none"> 1. Search DITA source to determine if <hazardstatement> elements use any of the following values for the @type attribute: <ul style="list-style-type: none"> • fastpath • important • note • other

Backwards-incompatible change	Migration approach
	<ul style="list-style-type: none"> • remember • restriction • tip <p>2. If any such elements are found, assess the hazard statement and do one of the following:</p> <ul style="list-style-type: none"> • Change the value of the @type attribute on the <hazardstatement> element • Convert the <hazardstatement> element to a <note> element
<hazardsymbol> contained by <hazardstatement>	<p>1. Identify <hazardstatement> elements that contain <hazardsymbol> elements.</p> <p>2. If such elements are found, move <hazardsymbol> elements into one of the following elements:</p> <ul style="list-style-type: none"> • <consequence> • <howtoavoid> • <typeofhazard> • (Discouraged, except as an interim migration step) <messagepanel>

The following figures contain examples of DITA 1.3 and DITA 2.0 markup for the backwards-incompatible changes:

Figure 9: <hazardstatement> element without a @type attribute

The following code sample represents DITA 1.3 markup; it contains a <hazardstatement> element that lacks a @type attribute.

```
<hazardstatement>
  <messagepanel>
    <typeofhazard>GENERAL HAZARDS</typeofhazard>
    <howtoavoid>Before initializing the system, verify that all electrical, communications,
      and utility connections are secure.
    </howtoavoid>
  </messagepanel>
</hazardstatement>
```

After examining the content, the information developer decides to recast it as a <note> for DITA 2.0:

```
<note type="other" othertype="GENERAL HAZARDS">
  <p>Before initializing the system, verify that all electrical, communications, and utility
    connections are secure.
  </p>
</note>
```

Figure 10: <hazardstatement> element with a @type attribute removed in DITA 2.0

The following code sample represents DITA 1.3 markup; it contains a <hazardstatement> element that uses a value for the @type attribute that is removed in DITA 2.0.

```
<hazardstatement type="restriction">
  <messagepanel>
    <typeofhazard>Lifting hazard</typeofhazard>
    <consequence>May result in injury.</consequence>
    <howtoavoid>See safety manual for lifting instructions.</howtoavoid>
```

```
</messagepanel>
</hazardstatement>
```

After examining the content, the information developer decides that the content is appropriate for a hazard statement, and changes the value of the @type attribute to caution.

```
<hazardstatement type="caution">
  <messagepanel>
    <typeofhazard>Lifting hazard</typeofhazard>
    <consequence>May result in injury.</consequence>
    <howtoavoid>See safety manual for lifting instructions.</howtoavoid>
  </messagepanel>
</hazardstatement>
```

Figure 11: <hazardsymbol> contained by <hazardstatement>

The following code sample represents DITA 1.3 markup; it contains a <hazardstatement> element that contains a <hazardsymbol> element.

```
<hazardstatement type="warning">
  <messagepanel>
    <typeofhazard>FLAMMABLE MATERIAL</typeofhazard>
    <consequence>Isopropyl Alcohol (IPA) vapors are flammable and can cause serious
      injury or death.
    </consequence>
    <howtoavoid>Remove ignition sources and do not use near heaters.</howtoavoid>
  </messagepanel>
  <hazardsymbol keyref="flammable-materials"/>
</hazardstatement>
```

The information developer reviews the image referenced by the <hazardsymbol> element, and decides that it represents the type of hazard. She modifies the markup as follows for DITA 2.0:

```
<hazardstatement type="warning">
  <messagepanel>
    <typeofhazard>
      <hazardsymbol keyref="flammable-materials"/>
      FLAMMABLE MATERIAL
    </typeofhazard>
    <consequence>Isopropyl Alcohol (IPA) vapors are flammable and can cause serious
      injury or death.
    </consequence>
    <howtoavoid>Remove ignition sources and do not use near heaters.</howtoavoid>
  </messagepanel>
</hazardstatement>
```

She also could have simply moved the <hazardsymbol> element into the <messagepanel> element:

```
<hazardstatement type="warning">
  <messagepanel>
    <typeofhazard>FLAMMABLE MATERIAL</typeofhazard>
    <consequence>Isopropyl Alcohol (IPA) vapors are flammable and can cause serious
      injury or death.
    </consequence>
    <howtoavoid>Remove ignition sources and do not use near heaters.</howtoavoid>
    <hazardsymbol keyref="flammable-materials"/>
  </messagepanel>
</hazardstatement>
```