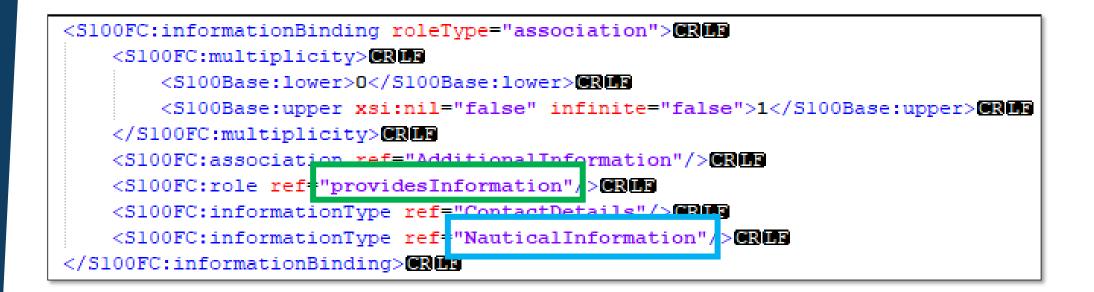# Problem

- Several cases have been identified where the *association roles* in the S-101 Feature Catalogue are inverted.

- *Information bindings* are probably not affected.

- The problem becomes visible in the *feature binding* element (sub-element *role*) of the affected *feature types*.

- The same problem exists in DCEG section 25 *Association Names.*

- Affected are DCEG Edition 1.2.0.20231127 and S-101 FC Edition 1.2.0 (2024-01-18).

Example: **Lateral Buoy**
Additional Information association

```xml
<S100FC:informationBinding roleType="association">
    <S100FC:multiplicity>
        <S100Base:lower>0</S100Base:lower>
        <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
    </S100FC:multiplicity>
    <S100FC:association ref="AdditionalInformation"/>
    <S100FC:role ref="providesInformation",>
    <S100FC:informationType ref="ContactDetails"/>
    <S100FC:informationType ref="NauticalInformation"/>
</S100FC:informationBinding>
```
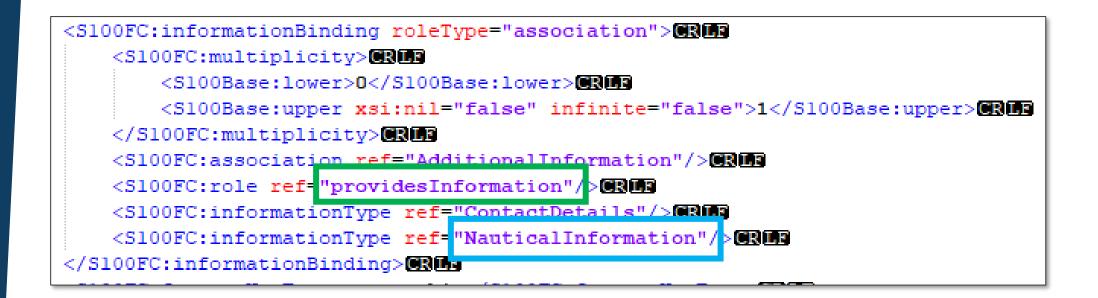
Interpreted as: *Nautical Information* provides Information for *Lateral Buoy.*

Example: **Light All Around**
Additional Information association

```xml
<S100FC:informationBinding roleType="association">
    <S100FC:multiplicity>
        <S100Base:lower>0</S100Base:lower>
        <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
    </S100FC:multiplicity>
    <S100FC:association ref="AdditionalInformation"/>
    <S100FC:role ref="providesInformation"/>
    <S100FC:informationType ref="ContactDetails"/>
    <S100FC:informationType ref="NauticalInformation"/>
</S100FC:informationBinding>
```

Interpreted as: *Nautical Information* provides Information for *Light All Around.*

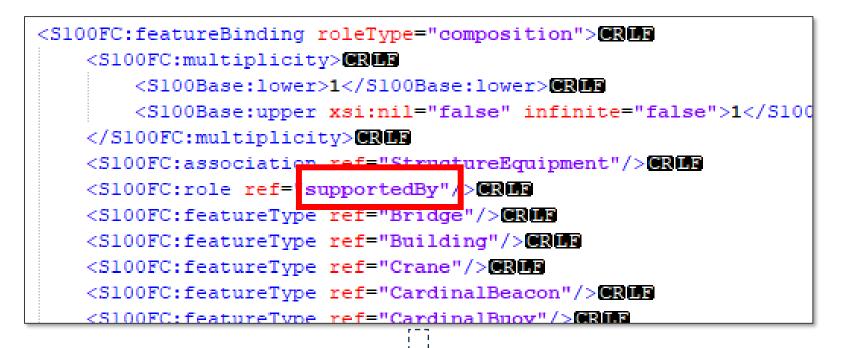# Example: **Lateral Buoy**
Structure Equipment association


```
<S100FC:featureBinding roleType="association">CRLF
    <S100FC:multiplicity>CRLF
        <S100Base:lower>0</S100Base:lower>CRLF
        <S100Base:upper xsi:nil="true" infinite="true"/>CRLF
    </S100FC:multiplicity>CRLF
    <S100FC:association ref="StructureEquipment"/>CRLF
    <S100FC:role ref="supports"/>CRLF
    <S100FC:featureType ref="Daymark"/>CRLF
    <S100FC:featureType ref="DistanceMark"/>CRLF
    <S100FC:featureType ref="FogSignal"/>CRLF
    <S100FC:featureType ref="LightAllAround"/>CRLF
    <S100FC:featureType ref="LightFogDetector"/>CRLF
    <S100FC:featureType ref="PhysicalAISAidToNavigation"/>CRLF
    <S100FC:featureType ref="RadarTransponderBeacon"/>CRLF
    <S100FC:featureType ref="Retroreflector"/>CRLF
```

Interpreted as: *Light All Around* supports *Lateral Buoy.* **ERROR: role is inverted!**

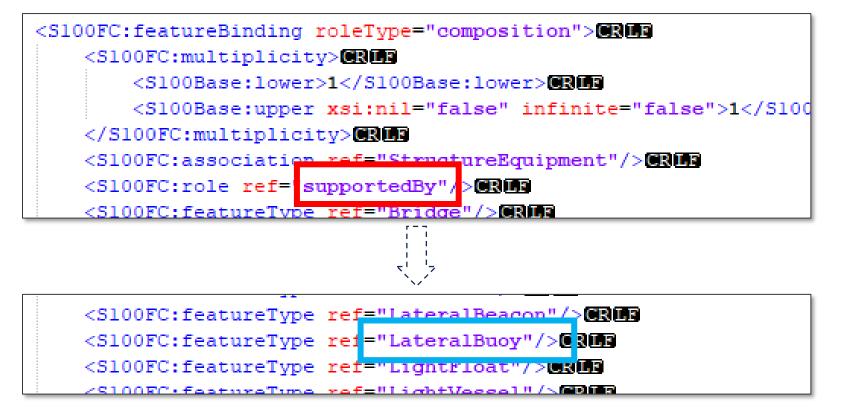Correct role: *Light All Around* **supported by** *Lateral Buoy.*

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Example: **Light All Around**
Structure Equipment association

```xml
<S100FC:featureBinding roleType="composition">CRLF
    <S100FC:multiplicity>CRLF
        <S100Base:lower>1</S100Base:lower>CRLF
        <S100Base:upper xsi:nil="false" infinite="false">1</S100
    </S100FC:multiplicity>CRLF
    <S100FC:association ref="StructureEquipment"/>CRLF
    <S100FC:role ref="supportedBy"/>CRLF
    <S100FC:featureType ref="Bridge"/>CRLF
    <S100FC:featureType ref="Building"/>CRLF
    <S100FC:featureType ref="Crane"/>CRLF
    <S100FC:featureType ref="CardinalBeacon"/>CRLF
    <S100FC:featureType ref="CardinalBuoy"/>CRLF
```

Example: **Light All Around**
Structure Equipment association

```
<S100FC:featureBinding roleType="composition">CRLF
    <S100FC:multiplicity>CRLF
        <S100Base:lower>1</S100Base:lower>CRLF
        <S100Base:upper xsi:nil="false" infinite="false">1</S100
    </S100FC:multiplicity>CRLF
    <S100FC:association ref="StructureEquipment"/>CRLF
    <S100FC:role ref="supportedBy"/>CRLF
    <S100FC:featureType ref="Bridge"/>CRLF
```

```
            1
    <S100FC:featureType ref="LateralBeacon"/>CRLF
    <S100FC:featureType ref="LateralBuoy"/>CRLF
    <S100FC:featureType ref="LightFloat"/>CRLF
    <S100FC:featureType ref="LightVessel"/>CRLF
```

Interpreted as: *Lateral Buoy* supported by *Light All Around*. **ERROR: role is inverted!**

Correct role: *Lateral Buoy* **supports** *Light All Around*.

Conclusions and recommendations

The S-101PT is invited to:

- Note this paper.
- Discuss the paper.
- Take action to correct the errors and update S-101 accordingly.

Thank You

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