The invention relates to a safety joint comprising:

a first riser part and a second riser part overlapping in an axial direction and having end connections to be connectable as part of a riser,

a release unit, locking the two riser parts together in a not activated mode, the release unit having other modes comprising a partly activated mode and fully activated mode,

where the release unit comprises at least one axial extending tension rod connected between the two riser parts, which tension rod is configured to deform plastically before breaking, thereby activating the release unit from the not activated mode to the partly and fully activated modes.

According to an aspect the safety joint includes at least a cylinder arrangement, wherein the cylinder arrangement is arranged such that it compensates the at least one tension rod for internal pressure in the riser in the not activated mode and the partly activated mode, and the safety joint in the fully activated mode.

The cylinder arrangement may also be adapted for increasing the forces acting against release of the first and second riser parts in the fully activated mode.

The safety joint according to the invention will normally be positioned in the lower half of the riser, in proximity of the wellhead. In such a position in the riser the safety joint will experience the larger forces from the surrounding water. The riser may be any kind of riser.

The safety joint will during normal operations not be activated, i.e. it will be in the not activated mode, but in cases of excessive tension in the riser, the safety joint will be activated by the excessive tension. Excessive tension will actuate the release unit in two intermediate steps until a potential complete disconnection; a partly activated mode, a fully activated mode (whereupon there will be a telescopic action in the joint), and potentially ending in the complete disconnection where the two riser parts are completely separated. Both the initial and the intermediate steps of the release unit will be pressure compensated for pressure in the fluid within the riser. These steps will give time to operate a safe disconnection of the riser from the wellhead. If not, the safety joint may also be configured to release the two riser parts from each other, as a complete disconnect.

According to an aspect the cylinder arrangement may comprise one cylinder set arranged such that it compensates the at least one tension rod for internal pressure in the riser in the not activated mode and the partly activated mode, and that the one cylinder set is adapted for increasing the forces acting against the release of the first and second riser parts in the fully activated mode. In another embodiment the cylinder arrangement may comprise several sets of cylinders, providing the different

The invention also relates to a method of operating a safety joint in case of excessive tension in a riser, providing a riser with a safety joint comprising a first riser part and a second riser part overlapping in an axial direction and connecting the ends to make the joint form part of a riser, the safety joint further comprising a release unit with at least one axial extending tension rod connected between the two riser parts, wherein

in a not activated mode, the safety joint is keeping the riser parts as one unit and pressure compensates the tension rods for internal pressure within the riser,

increasing the tension in the riser to a partly activated mode, thereby creating plastic deformation of the tension rods allowing the riser parts to move relative each other over a small distance,

further increasing the tension in the riser to a fully activated mode thereby breaking the tension rods,

and in all modes, not activated, partly activated and fully activated, allowing controlled disconnection of the riser at another joint in the riser,

or in a fully release mode, when tension is further increased, release the two riser parts of the safety joint.

The method may in one embodiment, after the step of increasing the tension in the riser to a fully activated mode thereby breaking the tension rods, further comprise a step of activating a set of cylinders in a cylinder arrangement and creating a force in the safety joint acting against the release of the two riser parts, and allowing telescopic action in the safety joint.

The fluid pressure of at least one cylinder of the cylinder arrangement may be used to control other elements of the riser, such as for instance the EQD connection or another riser joint in the riser such as the joint described in the applicants own patent NO 328634. The pressure signal from the pressure within the cylinder arrangement of the present invention may be transferred as input signals in the joint described in NO 328634.In the case where the safety joint is applied to a riser with no internal pressure, such as for instance a marine riser, the safety joint is applied to the riser without an arrangement for compensation for internal pressure.