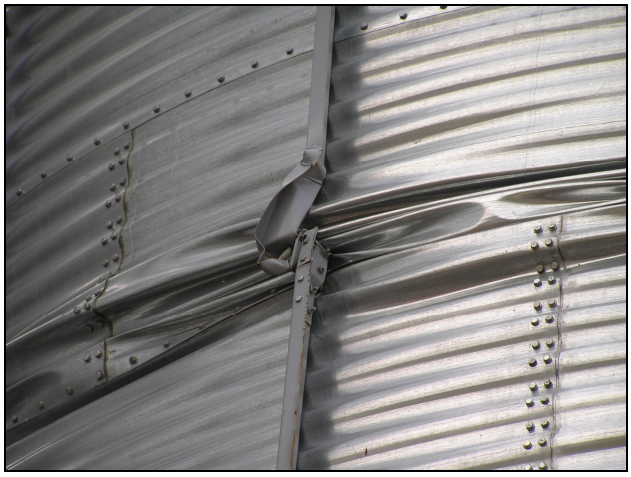
Another interesting example on this topic is bin trestle of the blast-furnace plant. According to the results of its technical review the technical condition of 30% of hoppers was found to be unsatisfactory, because their elements were in limited operating condition, the technical condition of the rest hoppers was considered extremely unsatisfactory - their elements were in accidental condition.

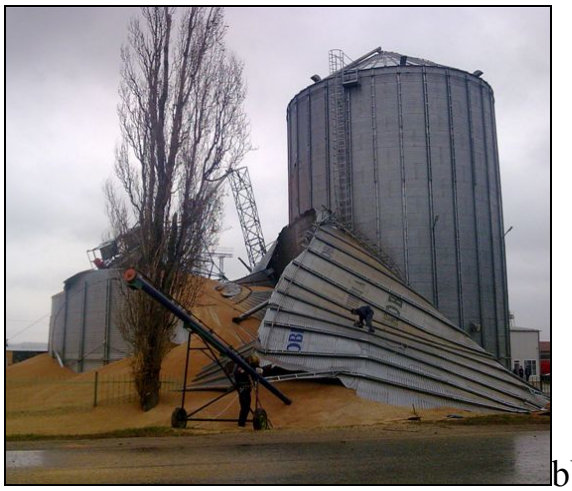
All hoppers of pyramidal-prismatic type with volume1000 m3 were performed on a single design scheme with a saddle-shaped frame in the center. Among the noted defects there were breaks of joint block of saddle-shaped frame elements with each other and with elements of the hopper. As a result the frame was completely excluded from work as a bearing element. The accident was avoided only because it turned out that all the calculated by the same official methodology hoppers in this case had a considerable reserve of strength, and because of the faults noticed in time the intensity of their use was dramatically reduced.

The main mistake of manufacturing steel capacitive structures for bulk materials is digression from the project and implementation of a number joints or elements of construction not on the project. For example, Figure 6a shows a photograph of damage of the joint block of vertical supporting stands in the grain silo with volume 400 m3. It emerged because of the incorrectly changed section of the stand in height [9]. As a result, the structure zone was weakened enough that the entire shell has lost local stability. During the subsequent loading of the silo construction there happened an accident with complete destruction of the structure (**Figure 6b**).

The second error of this group is unsatisfactory alignment of elements, resulting in the formation of mismatch of separate constructs. The situation is compounded by the fact that the capacitive structures are mostly large, that's why taken in domestic practice seemingly minor tolerances and deviations result in quite significant errors, breaking the scheme of construction. Figure 7 shows the silos with volumes about 5000 m^3, in which due to excessively large gaps in the joints connecting the main building with the roof the latter fell inside during application of wind load.



a)



b)

Figure 6. Damage of the joint block of vertical supporting stands (a), which led to the silo collapse (b)

In most cases, the operating error of steel silos and hoppers, do not lead to serious accidents if they are timely revealed and the appropriate measures. However, the lack of a permanent inspection of capacitive structures during operation is likely to lead to negative consequences, since such structures are with a high wearability elements.

Such main element is lining of the construction walls. As practice shows its wear can be quite substantial, what immediately leads to the wear and tear of the structure walls, reducing its thickness and, accordingly, load-bearing ability.

According to the survey of capacities for coke, presented in paper [10], the corrosive wear of the walls made almost 30% of wall thickness for 50 years of operation in conditions of an industrial enterprise in Poland.

Another serious problem is the corrosive wear of steel capacitive structures. Such damages are the most wide-spread defect in the vast majority of metal structures, but as for steel capacitive structures this issue is particularly acute. First of all, such structures often operate in extremely corrosive environment - hoppers for coke, sinter, tanks for salt. The rate of corrosion of unprotected