which it is attached. It is not permiss-
sible to insert such patches in the shell
or head flush with the surrounding
plate unless the requirements of this
subchapter for Class I welded pressure
vessels are met.
(b) Portions of tube sheets which
have deteriorated may be renewed by
replacing the wasted portion with a
new section. The ligaments between
the tube holes may be joined by means
of welding and staytubes. Other accept-
able means of lowering the stress on
the repaired section may be used if in
the judgment of the Officer in Charge,
Marine Inspection, it is necessary.

§ 59.10–25 Stayed areas.
Welding repairs are permitted in
staybolted areas or areas adequately
stayed by other means so that should
failure of the welds occur the stress
will be carried by the stays. The welds
shall be located entirely within
staybolted areas and shall not pass
through the outer row of stays.

§ 59.10–30 Seal welding.
Where leaks occur in riveted joints or
connections, they shall be carefully in-
vestigated to determine the cause.
Such leaks may be made tight by seal
welding the edge, if, in the opinion of
the Officer in Charge, Marine Inspec-
tion, this will make a satisfactory re-
pair.

§ 59.10–35 Wrapper plates and back
heads.
Wrapper plates and back heads may
be renewed in whole or repaired as fol-
lows:
(a) Wrapper plates or backs heads
shall be cut between two rows of
staybolts or on a line of staybolts
where the thickness is approximately
the same as the original construction.
If welding is employed on a line of
staybolts, the staybolts shall be fitted
with a welded collar as required by Fig-
ure 52.01–3 of this subchapter.
(b) The edges of wrapper plates riv-
eted to tube sheets and back heads
shall be removed by cutting out the
rivets.
(c) The edges of existing plates and
new plates shall be beveled by chipp-
ing, flame cutting or grinding so as to
form a suitable groove whereby com-
plete penetration of the weld metal
will be obtained. The edge preparation
and preheat shall comply with the re-
quirements of §59.10–5(h).
(d) The edges of the new plate shall
be buttwelded and the plate shall be
riveted to the flanges of the tube sheet
and back heads and the staybolts re-
newed.
(e) Sections of wrapper plates of com-
bustion chambers outside of stayed
areas may be repaired by welding pro-
vided the welded joints are stress-re-
lieved by means of controlled heat and
the joints are nondestructively tested.

Subpart 59.15—Miscellaneous
Boiler Repairs

§ 59.15–1 Furnace repairs.
(a) Where corrugated or plain fur-
naces or flues are distorted by 1½
inches or more, they shall be repaired
by either of the following methods:
(1) The furnace shall be forced back
to a true circular shape, and the Officer
in Charge, Marine Inspection, may re-
quire strongbacks or other acceptable
means of support to hold the furnace
from future collapse, if in his opinion
such support is necessary; or,
(2) The furnace shall be adequately
stayed as found necessary in the judg-
ment of the Officer in Charge, Marine
Inspection.
(b) Distortion means the difference
between any single measured diameter
of the furnace and the diameter of a
true circle at the same location. The
diameter of the true circle may be
taken as the original furnace diameter
or may be determined by a means ac-
ceptable to the Officer in Charge, Ma-
rine Inspection.
(c) Where the distortion does not ex-
ceed 1½ inches it will not be necessary
to force the furnace back to a true cir-
cle if the allowable pressure is reduced
in the ratio of 1½ percent for each one-
tenth of an inch of distortion. However,
if the maximum distortion does not ex-
ceed 1 inch and the length of the dis-
torted area is not more than three cor-
rugations, or, if the maximum distor-
tion does not exceed three-fourths inch
for a length greater than three cor-
rugations of distorted area, the repairs