



Comanche 3 ACC Internal Inspections: 7-year status report

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Las Vegas, NV

Comanche Station Unit 3



Comanche Station Unit 3

Steam Cycle Chemistry

- **pH control limits 9.45 – 9.60**
 - ammonium hydroxide
- **deep bed condensate polisher**
- **oxygen feed initiated September 2016**
- ***iron: < 0.3 ppb at economizer inlet***
1 – 3 ppb HP heater drain

Comanche 3 ACC Internal Inspection History

Commissioned July, 2010

- **Internal Inspections (upper ducts 1 and 2 only, of 9 total):**
 - **September 2011 [14 months]**
 - **September 2014 [50 months]**
 - **April 2017 [81 months]**

DHACI

lower duct: (best) **A-B-C** (worst)

upper duct: (best) **1-2-3-4-5** (worst)

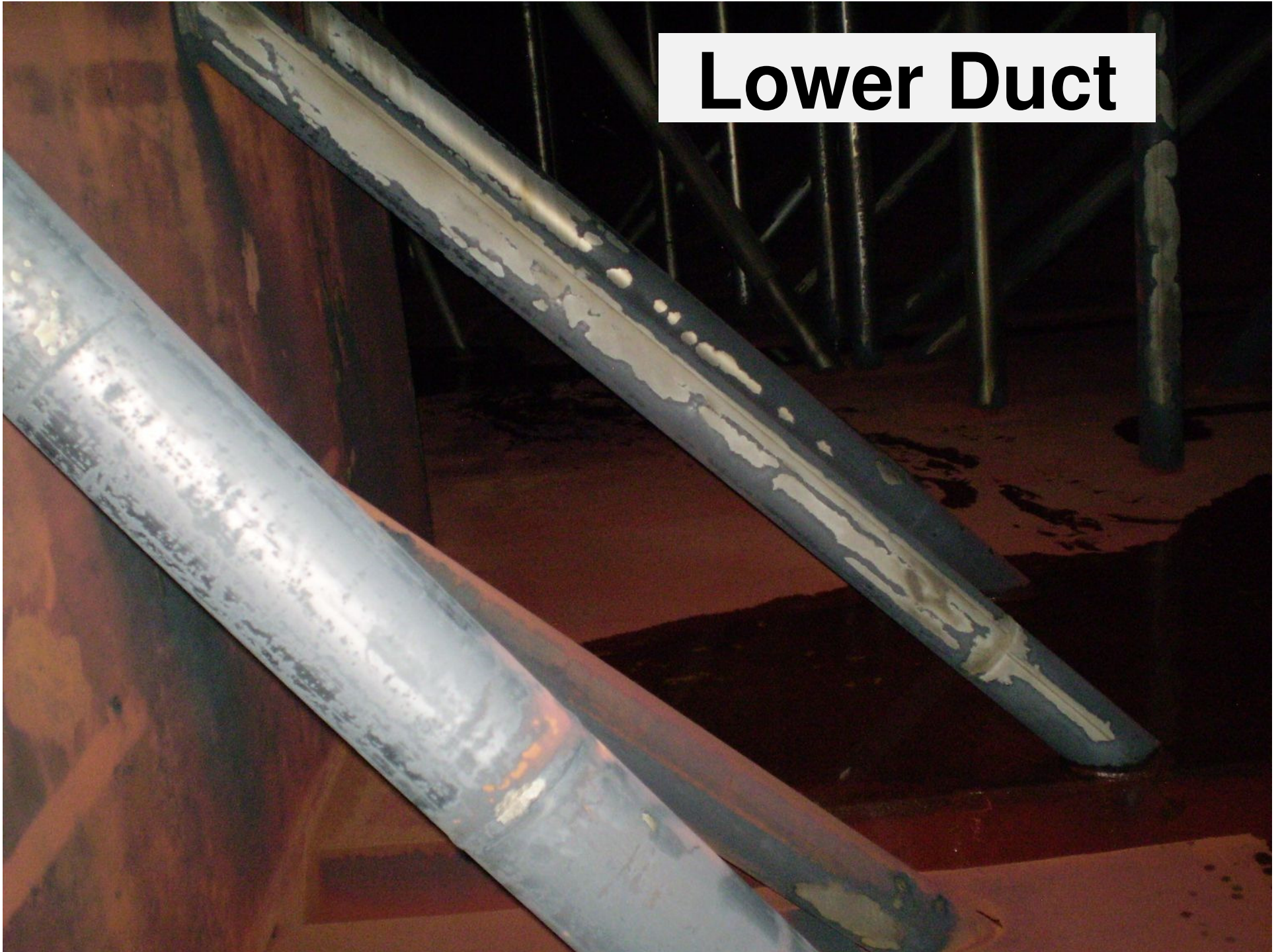
14-month internal inspection September, 2011

DHACI rating

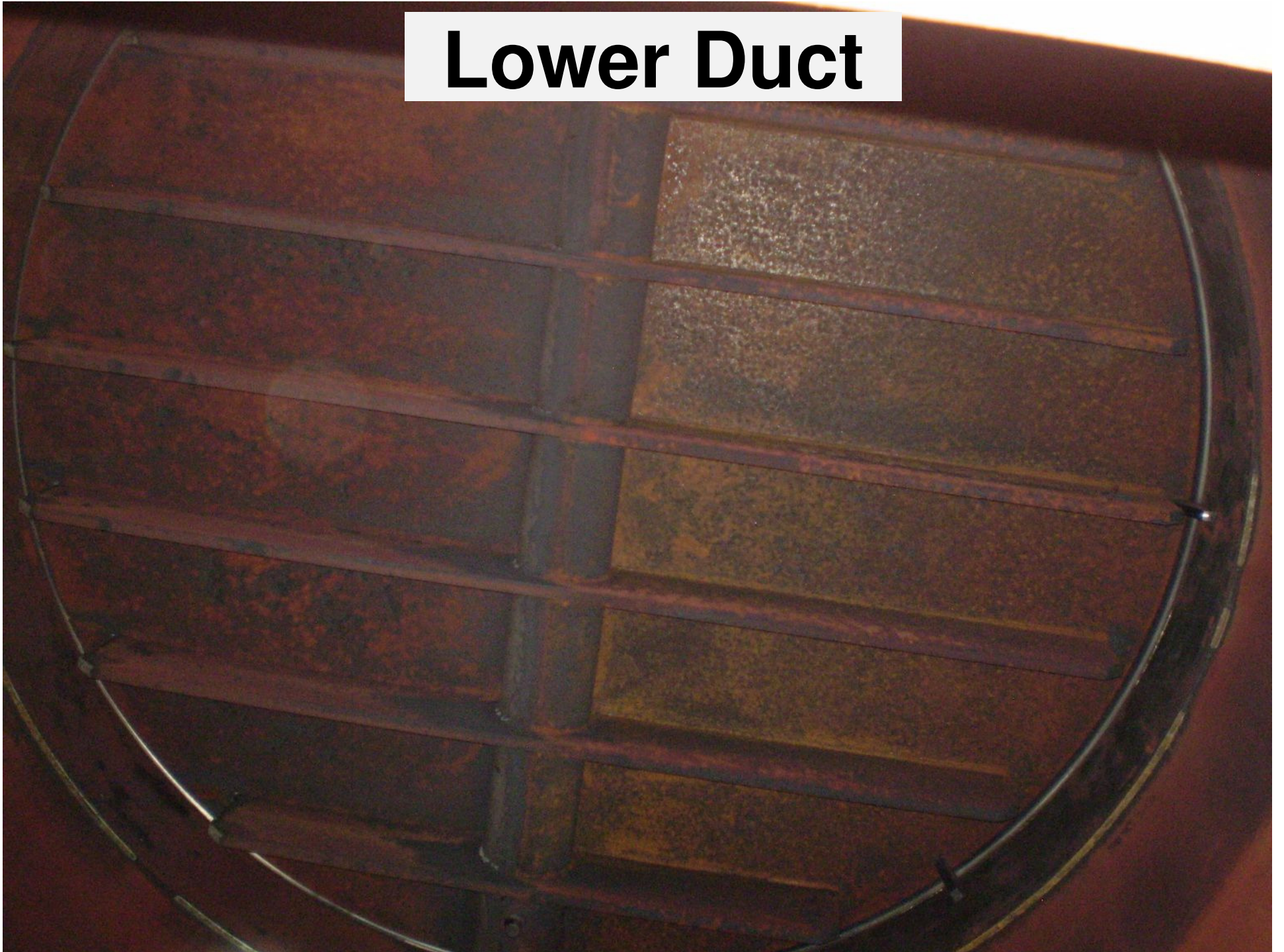
lower duct: B

upper duct: 2

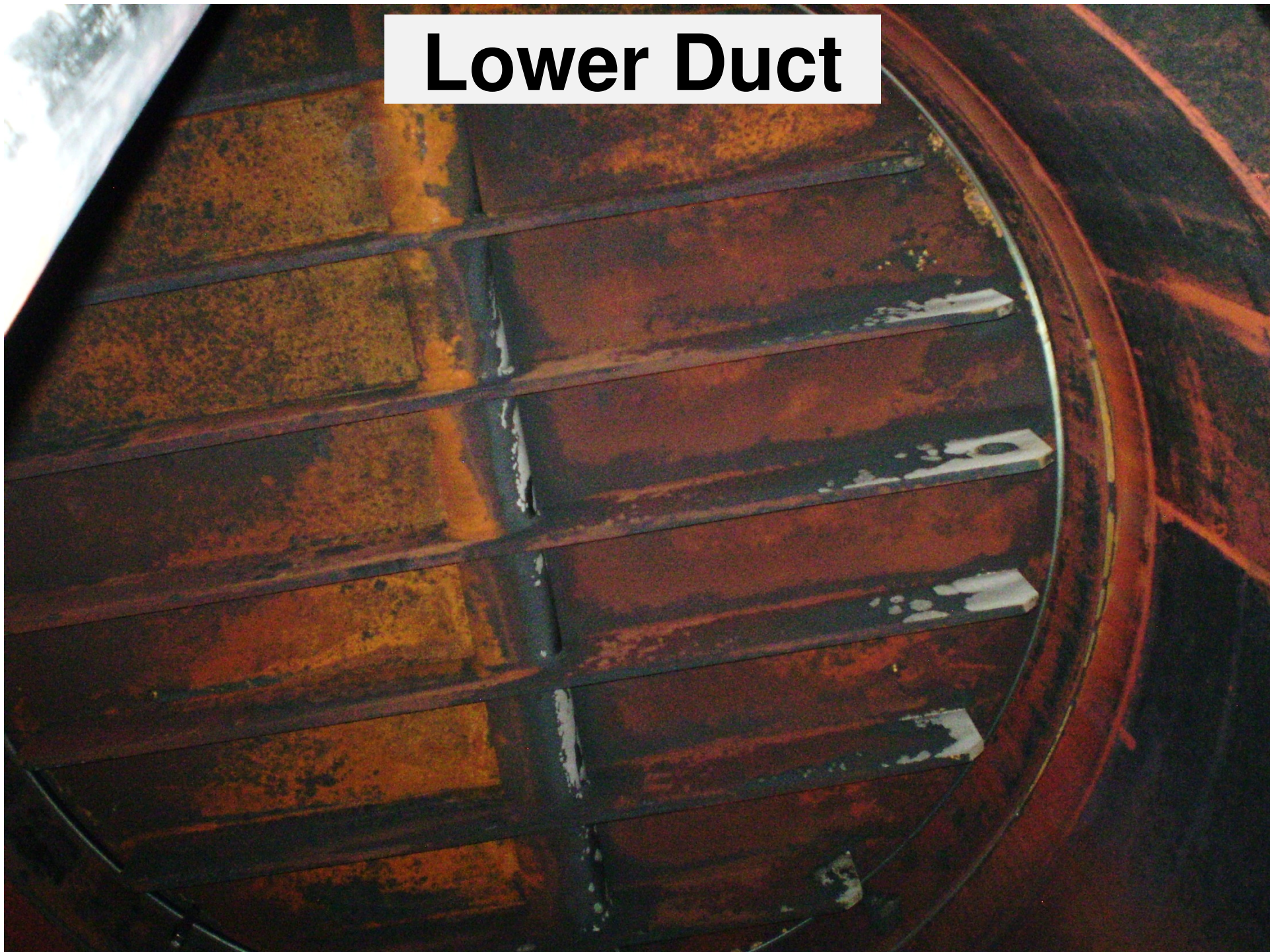
Lower Duct



Lower Duct



Lower Duct



Lower Duct

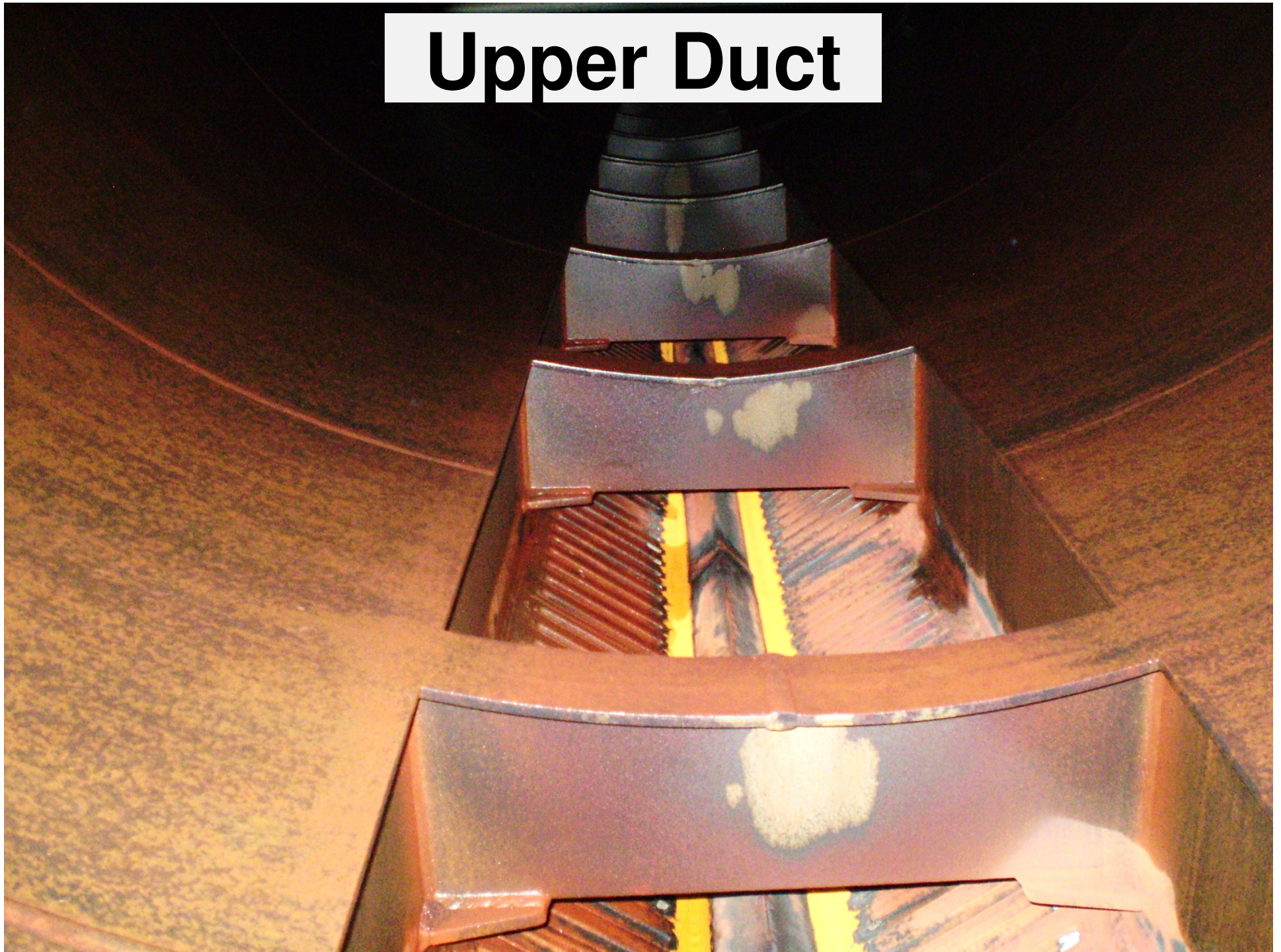


14-month internal inspection September, 2011

DHACI rating

lower duct: B

Upper Duct



Upper Duct



Upper Duct



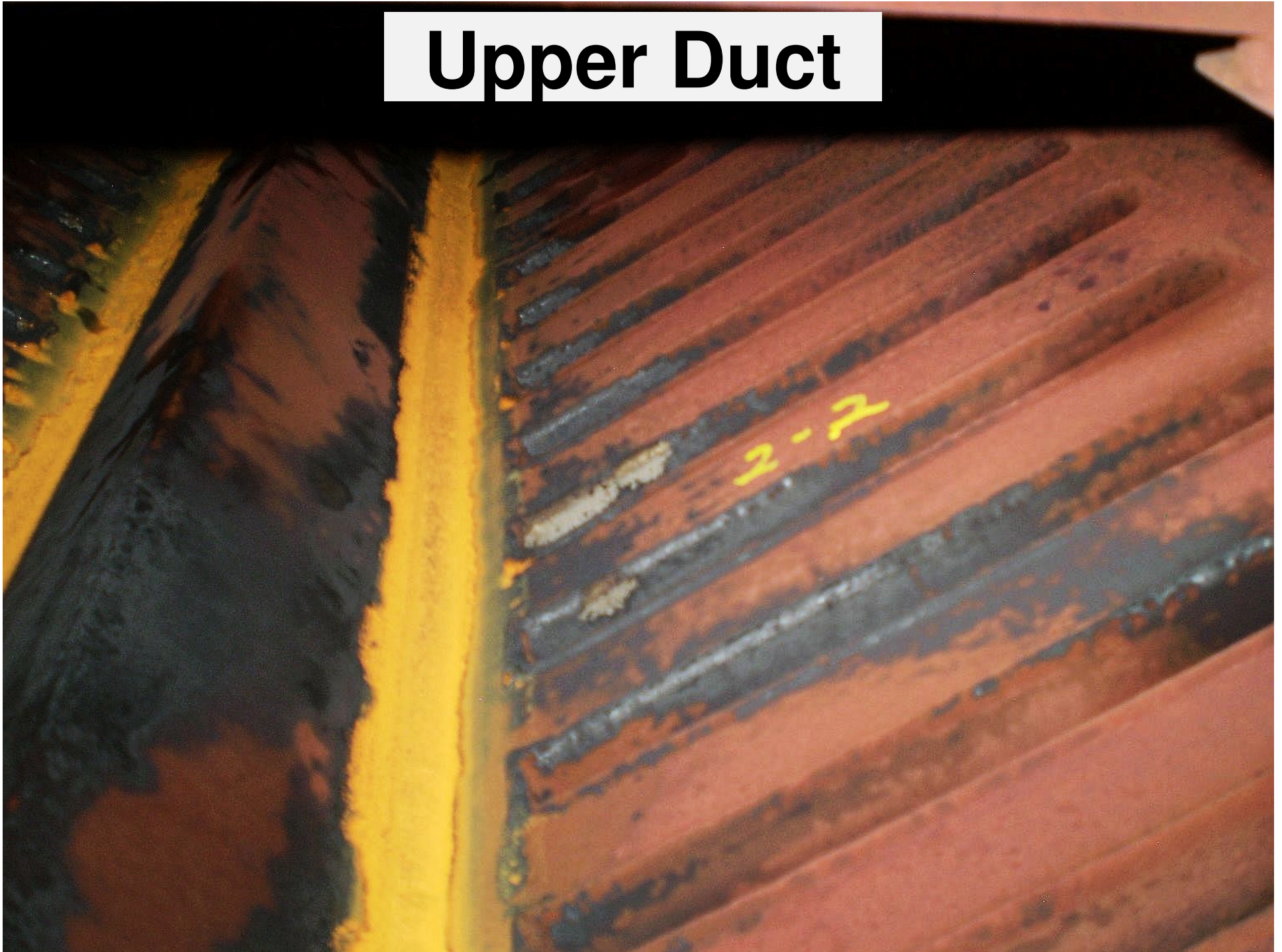
Upper Duct



Upper Duct



Upper Duct



Upper Duct



14-month internal inspection September, 2011

DHACI rating

upper duct: 2

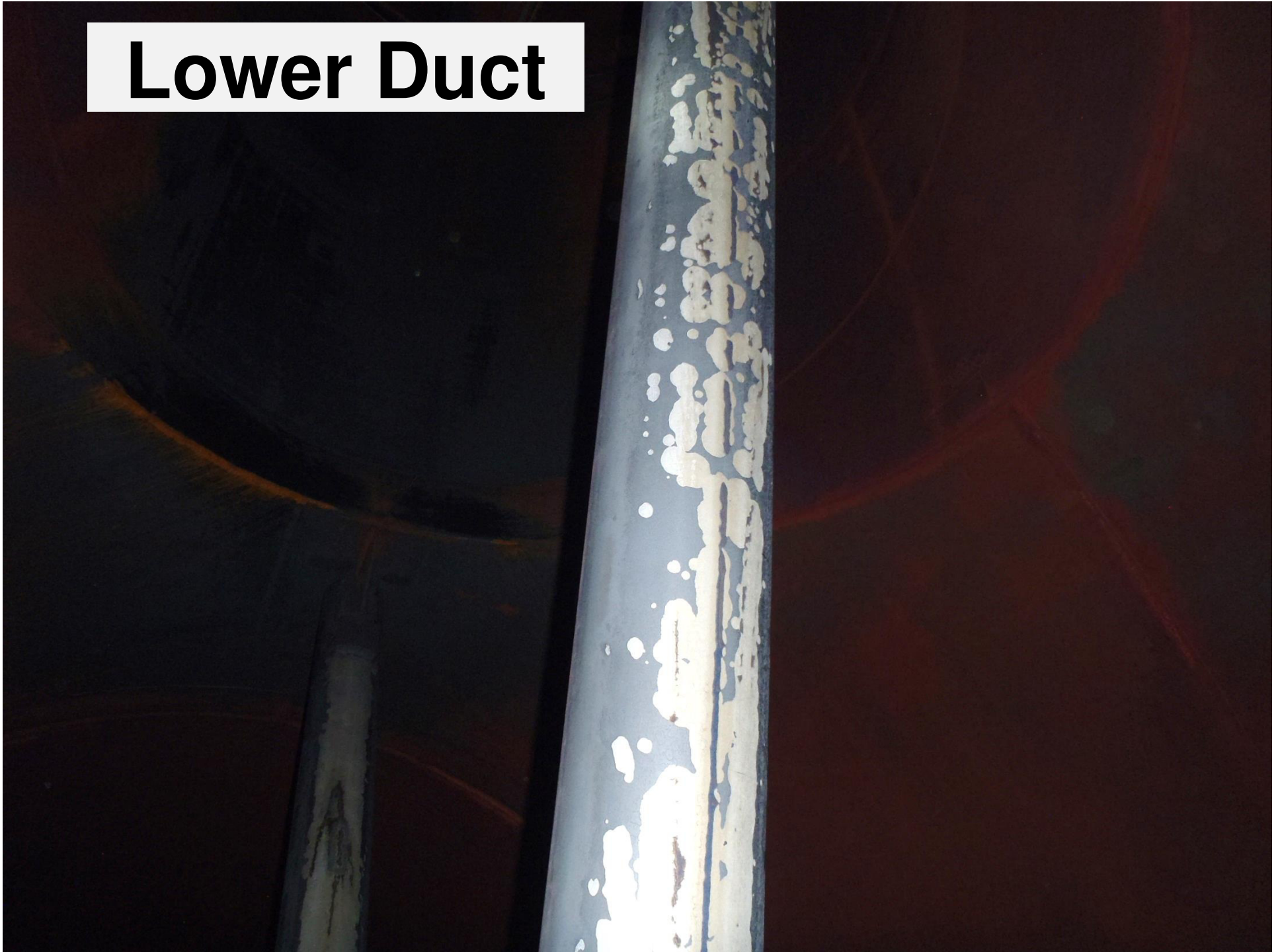
50-month internal inspection September, 2014

DHACI rating

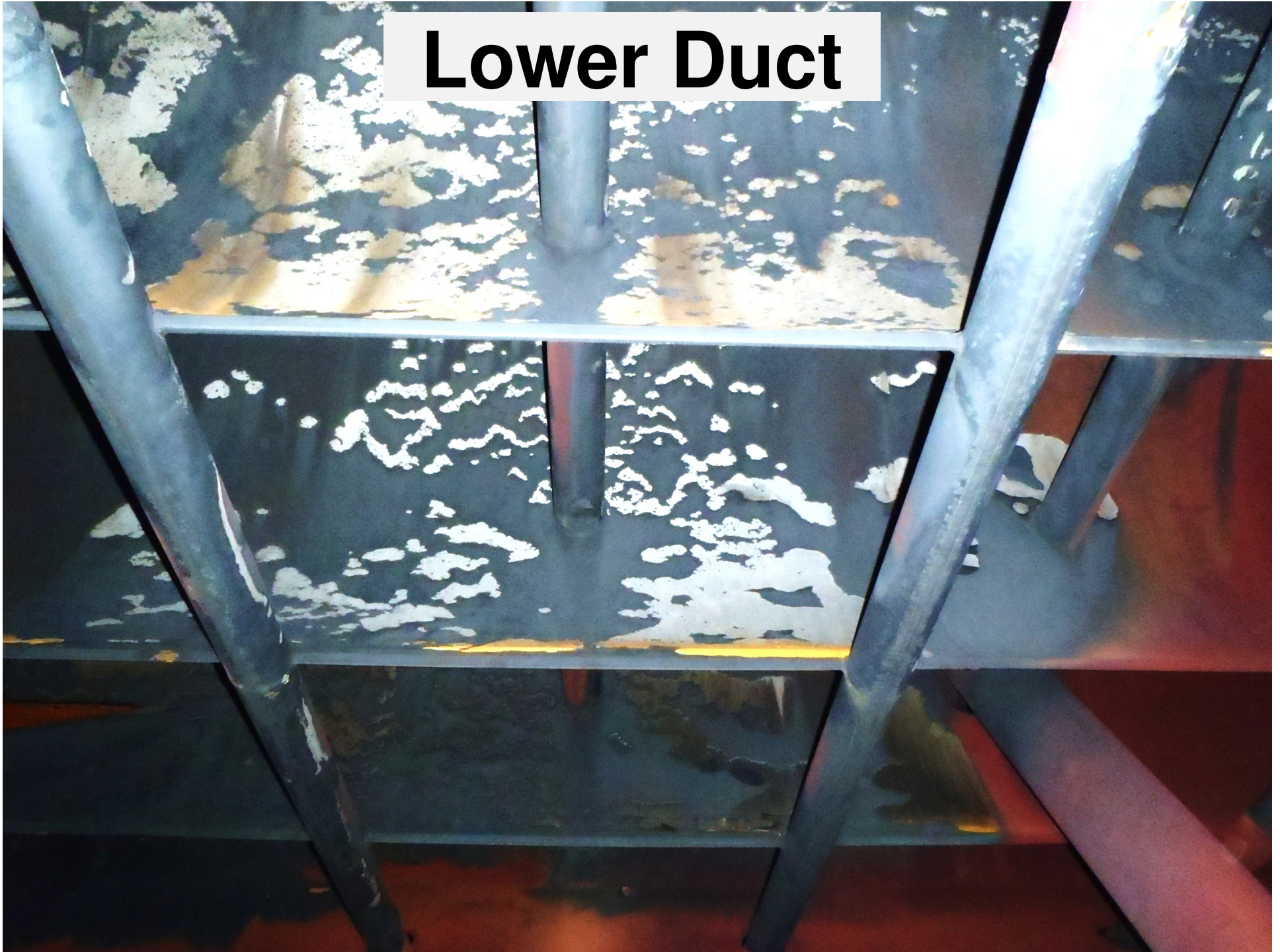
lower duct: B

upper duct: 1

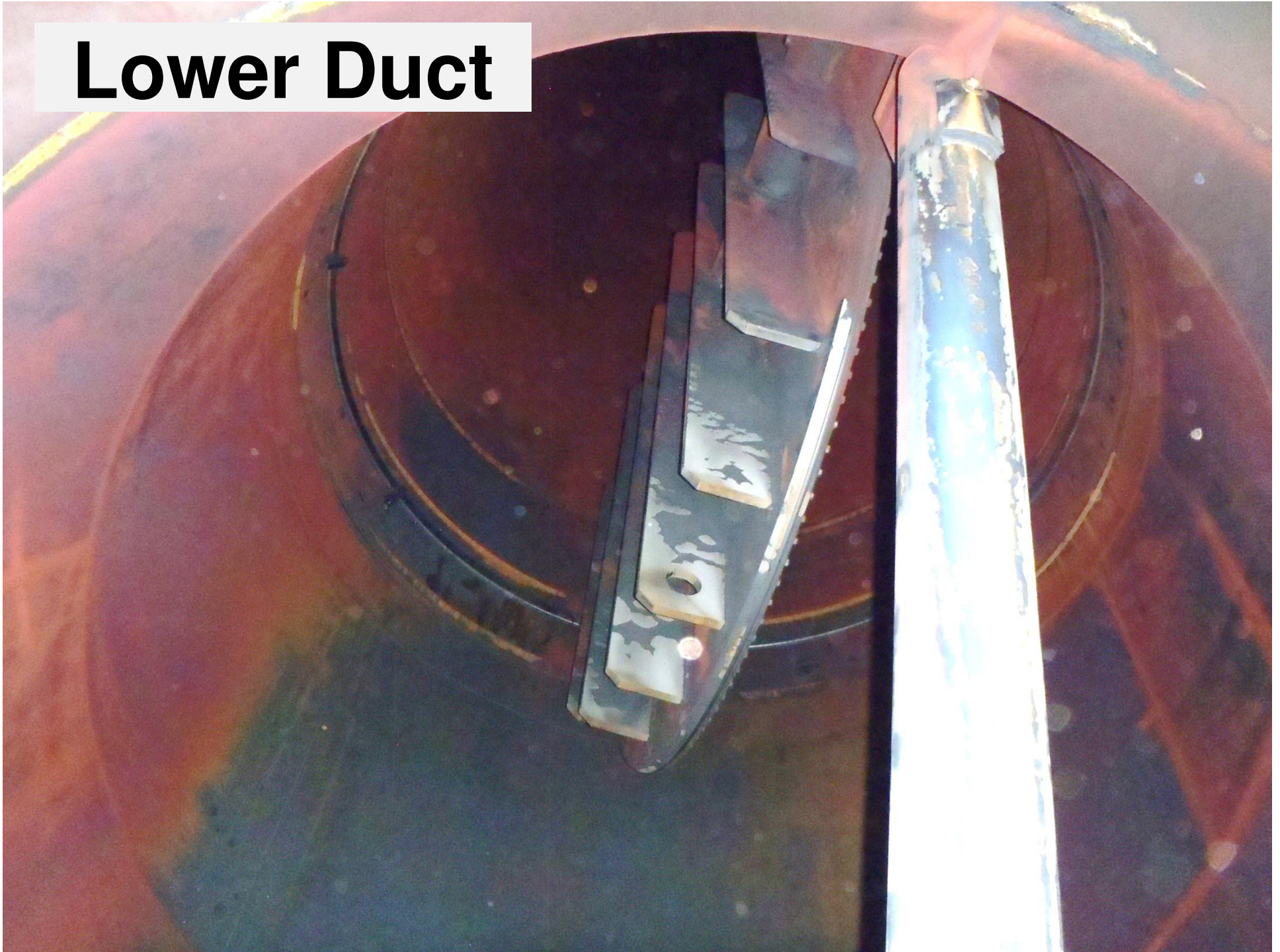
Lower Duct



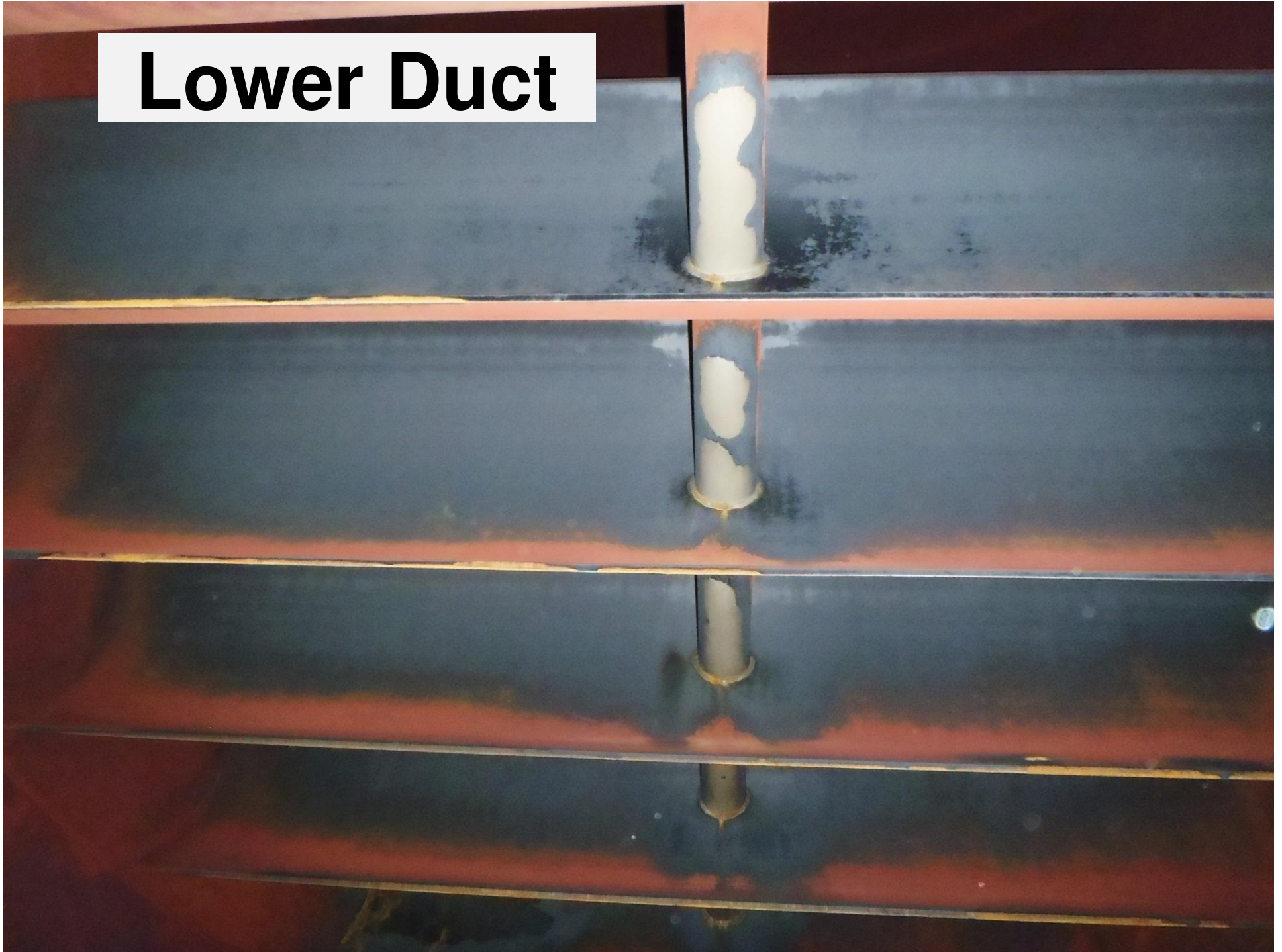
Lower Duct



Lower Duct



Lower Duct

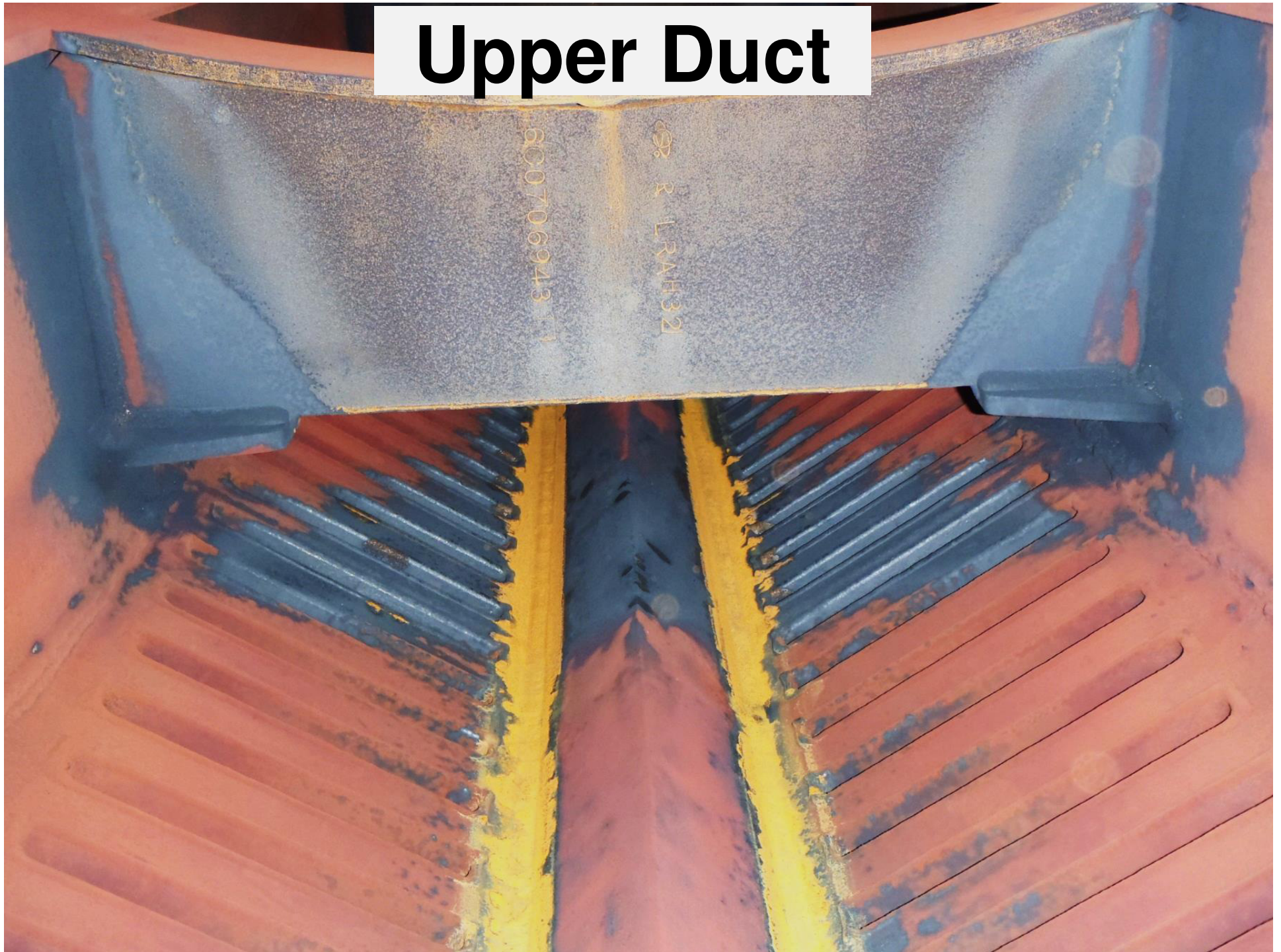


50-month internal inspection September, 2014

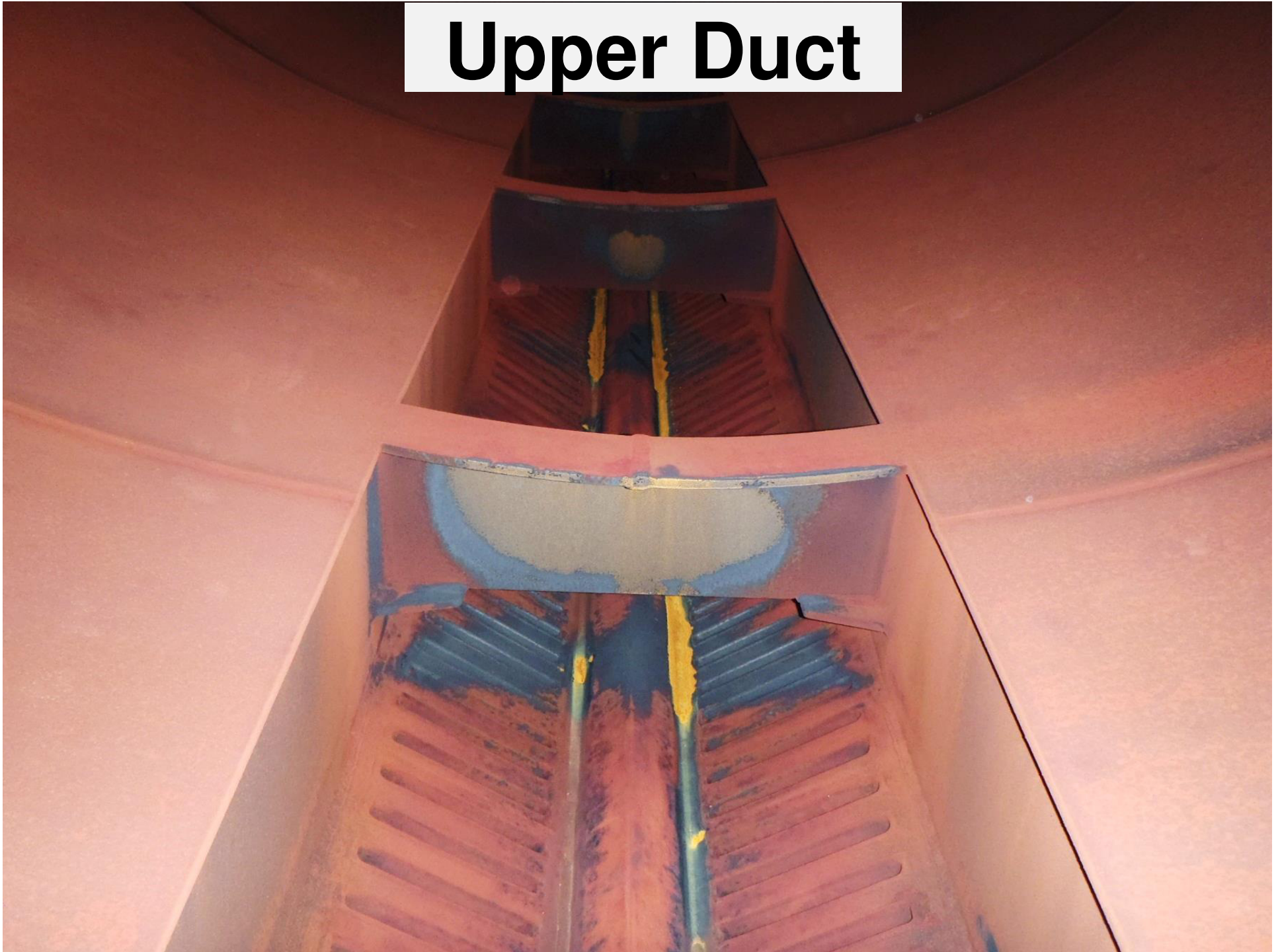
DHACI rating

lower duct: B

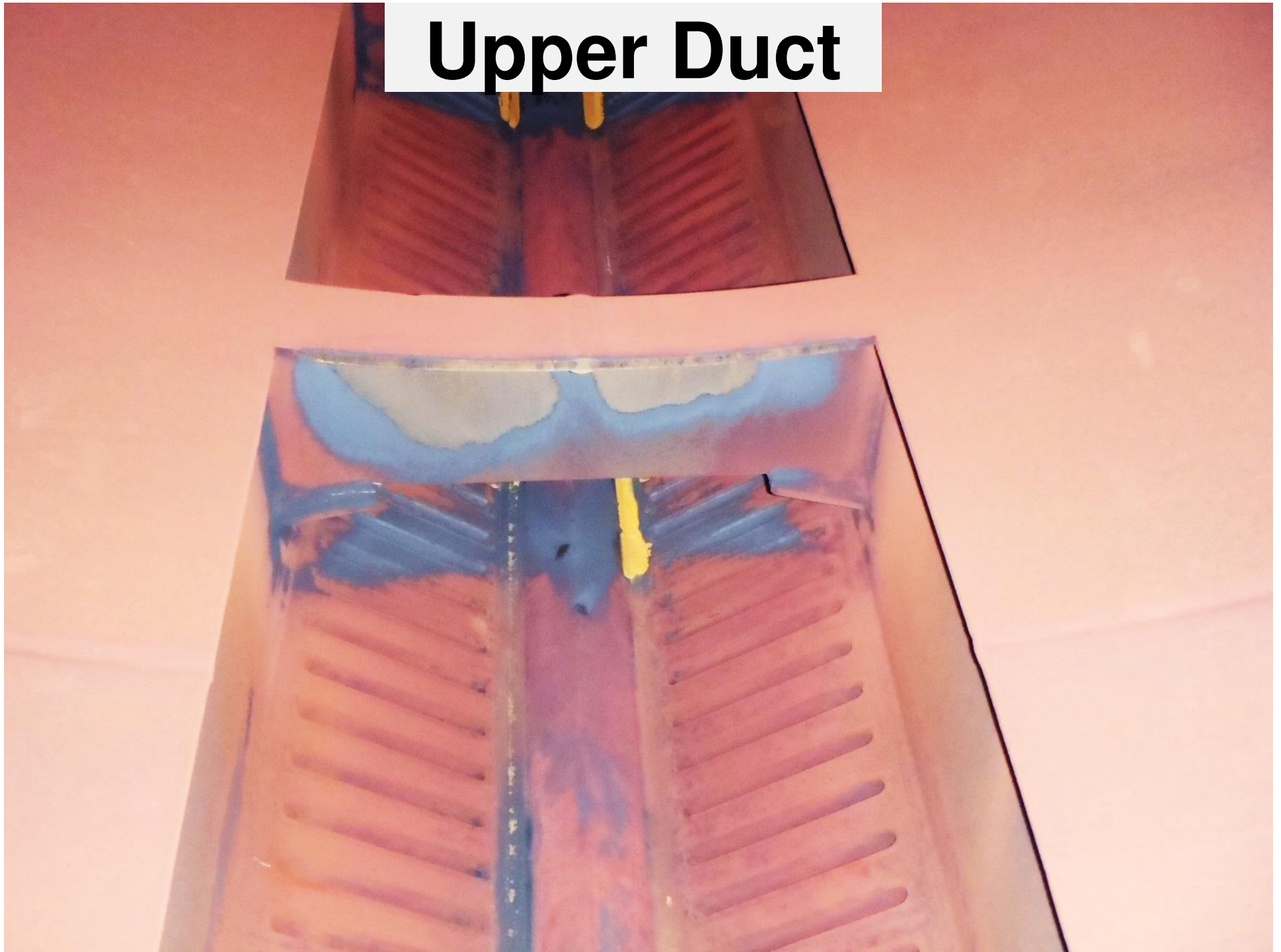
Upper Duct



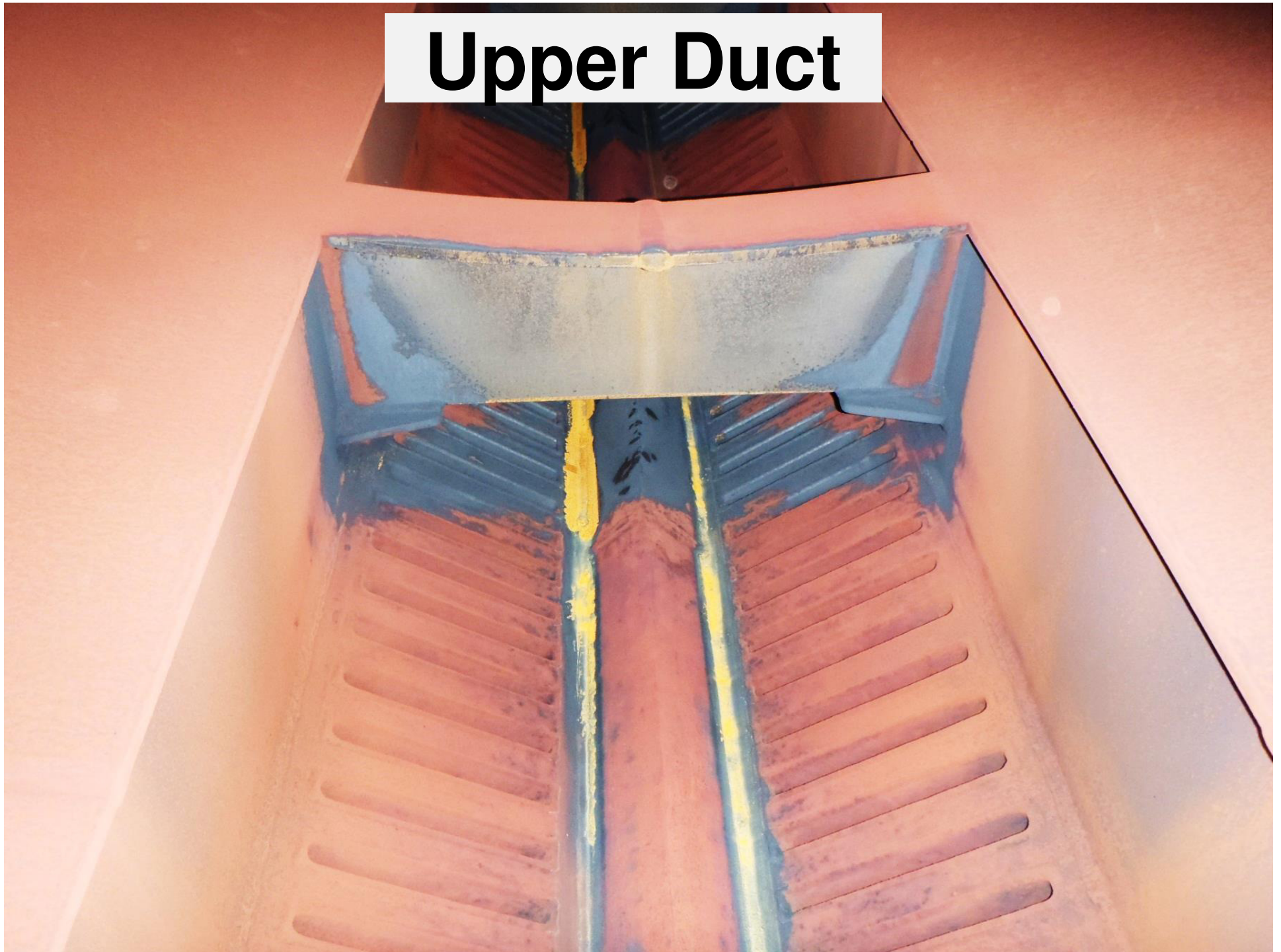
Upper Duct



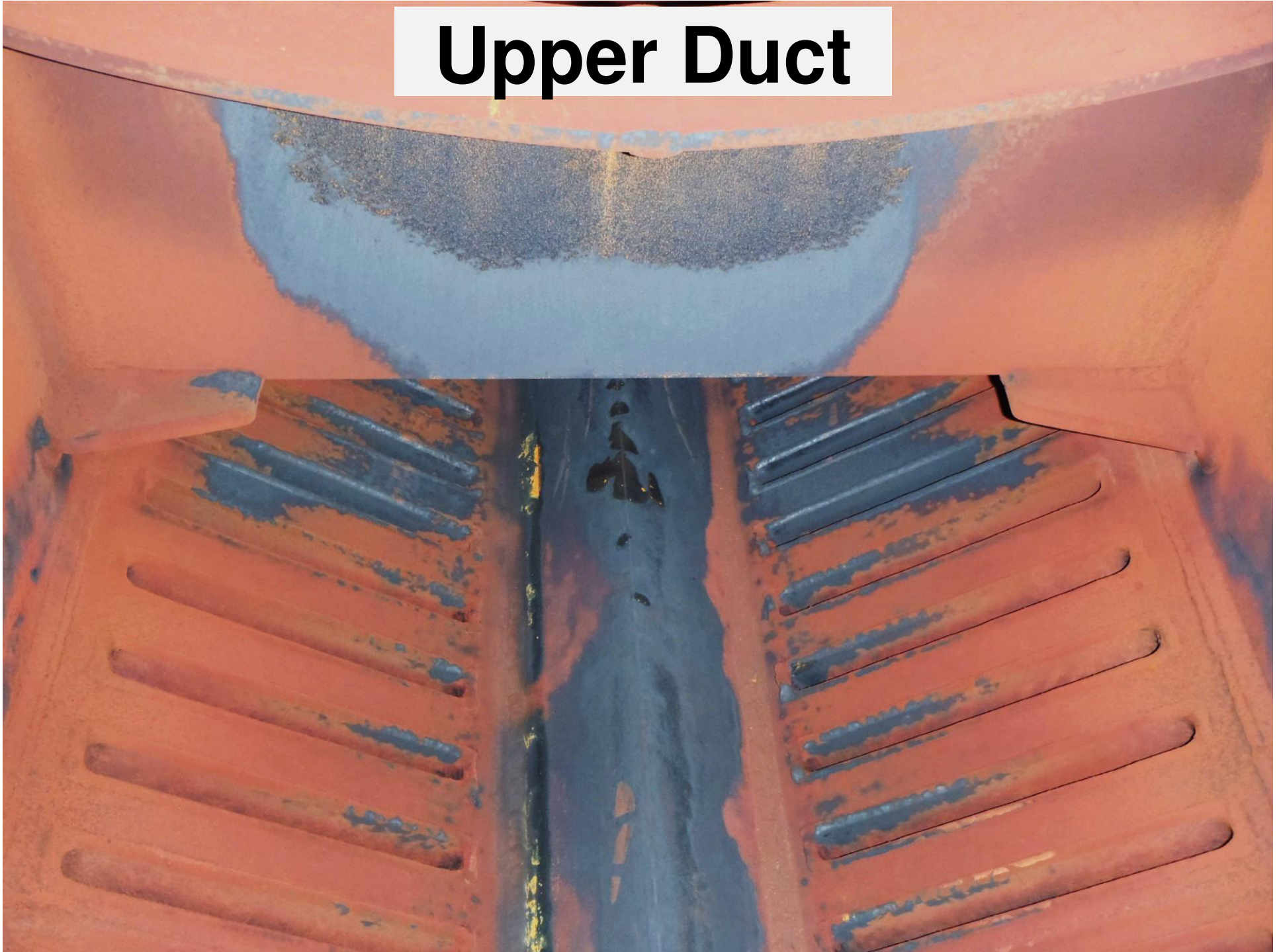
Upper Duct



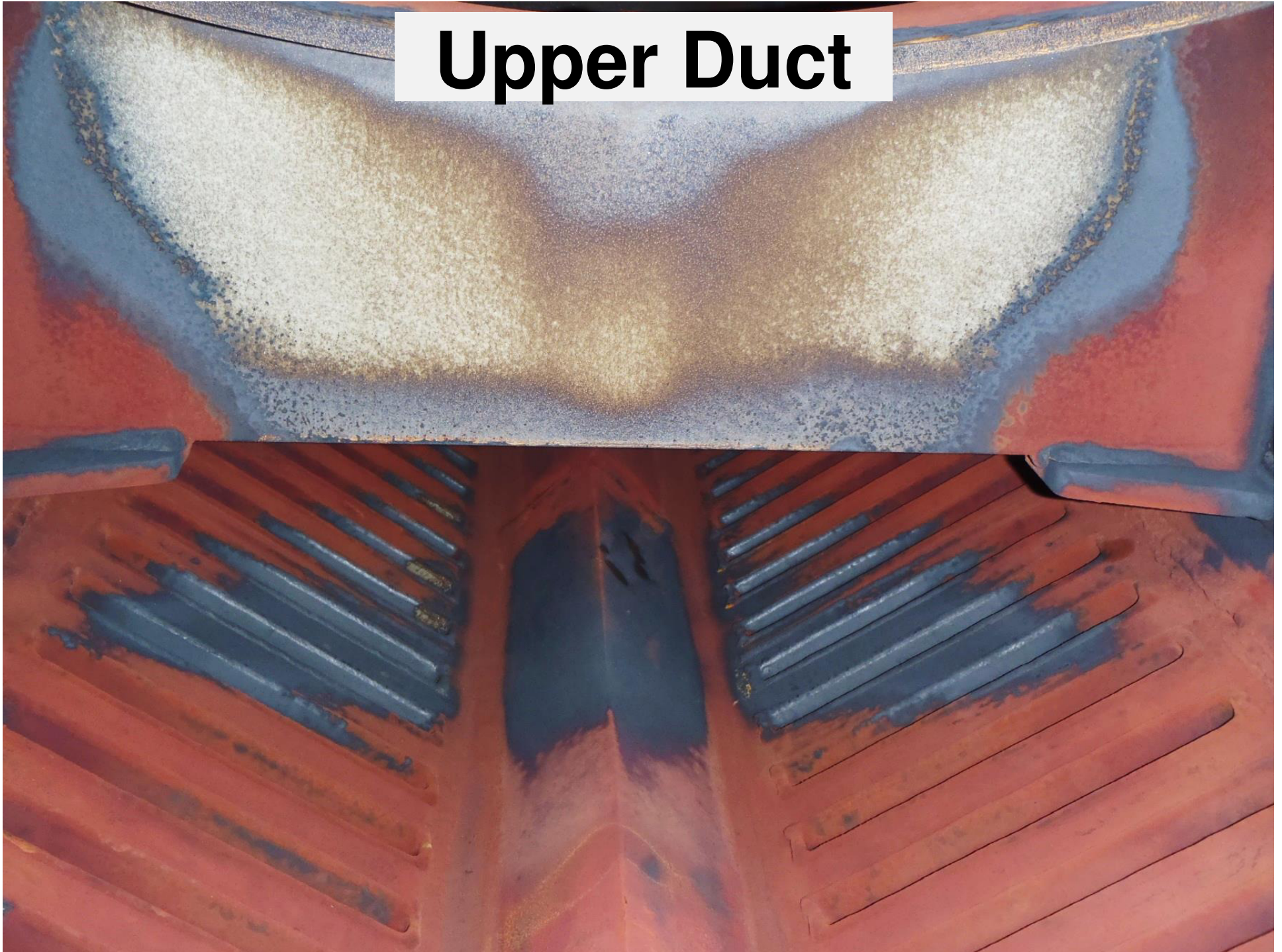
Upper Duct



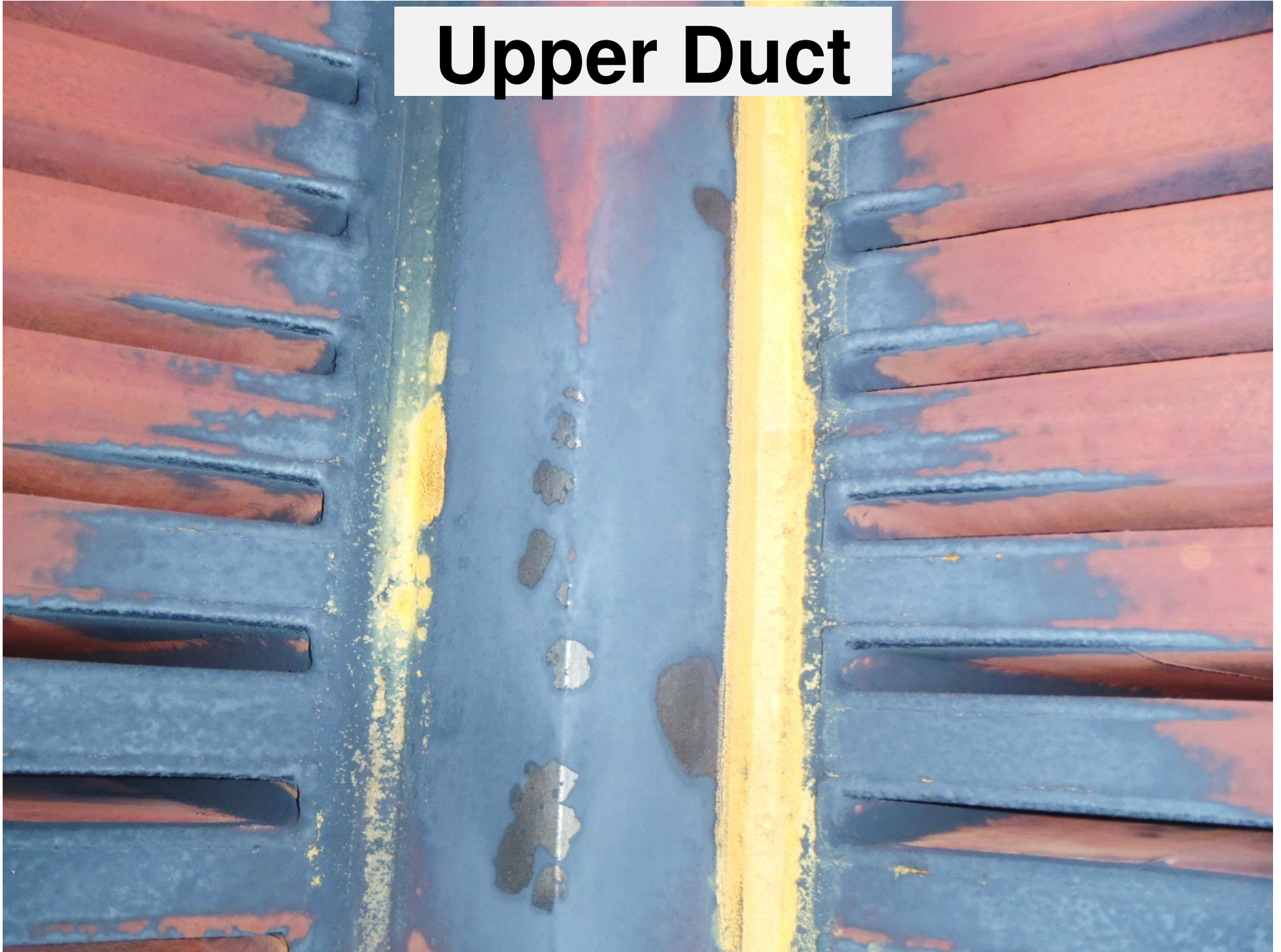
Upper Duct



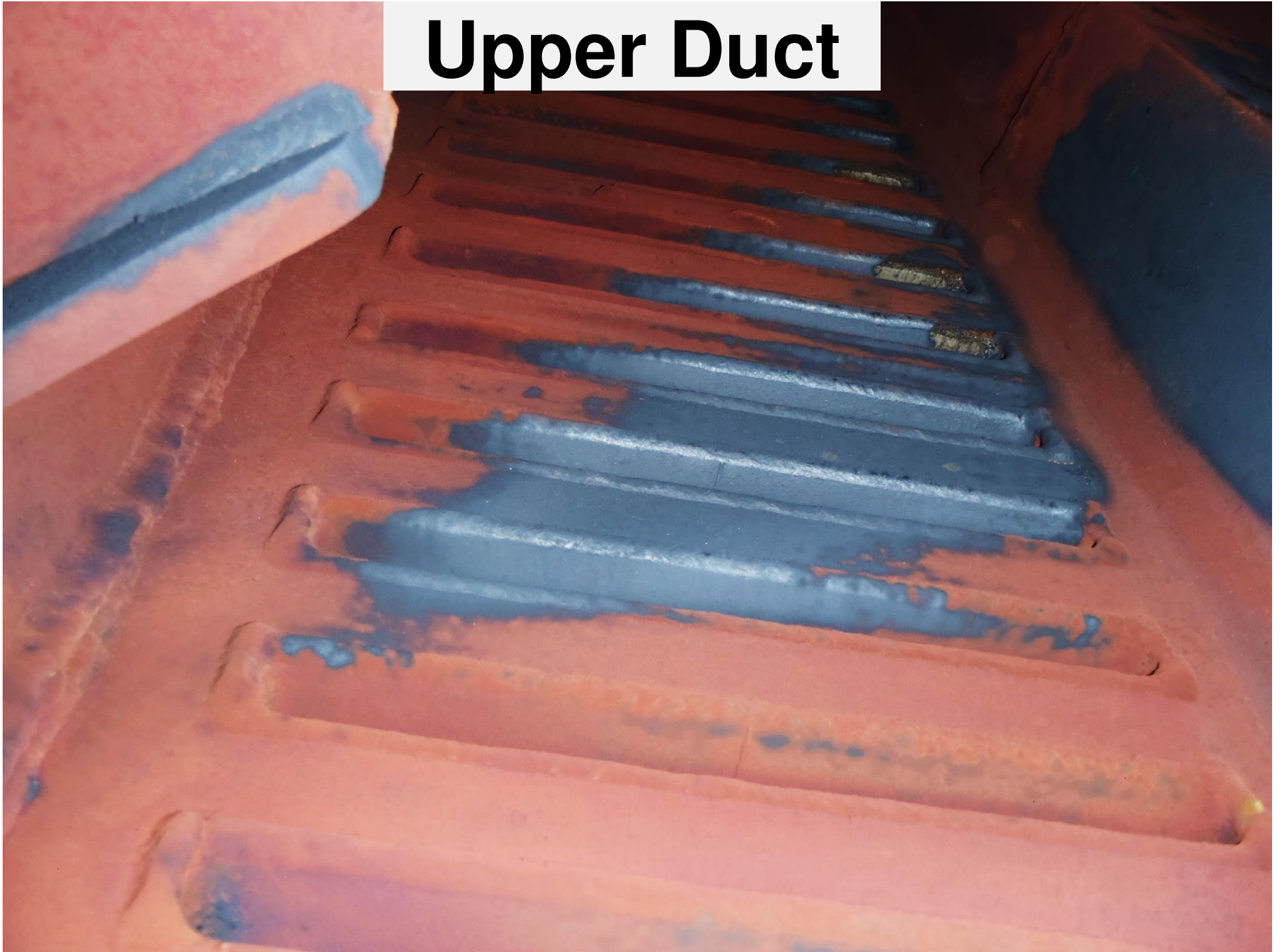
Upper Duct



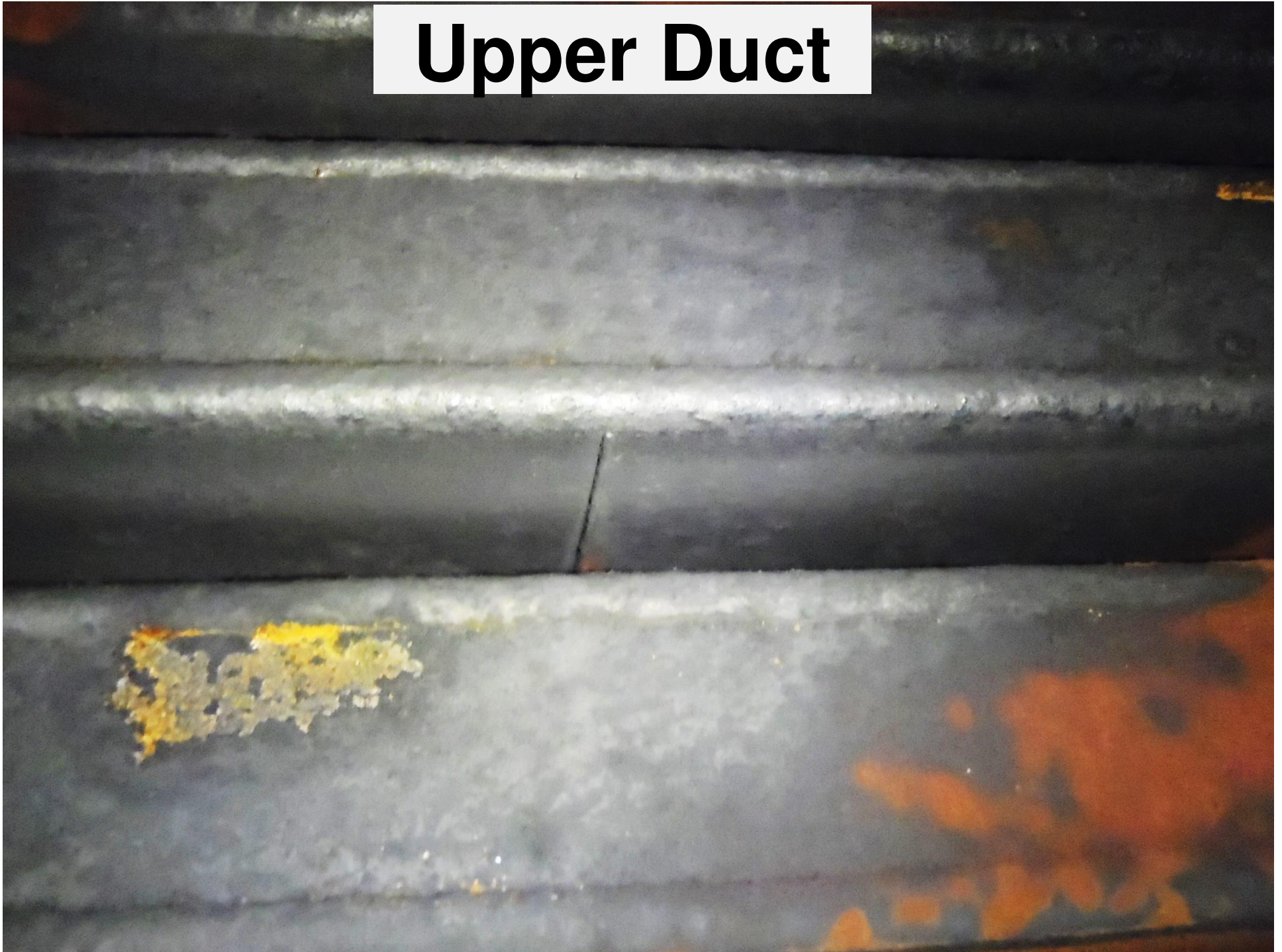
Upper Duct



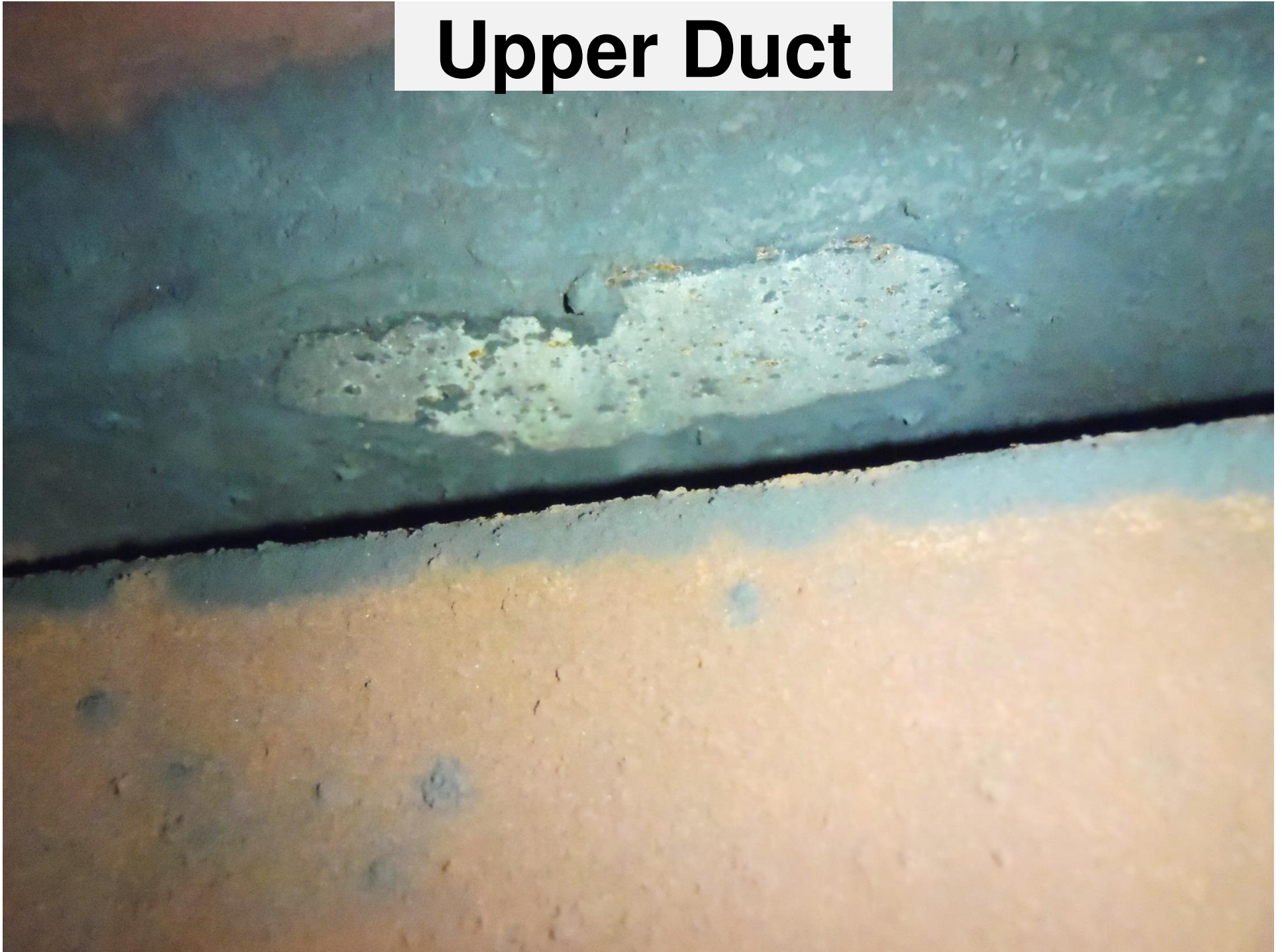
Upper Duct



Upper Duct



Upper Duct



50-month internal inspection September, 2014

DHACI rating

upper duct: 1

81-month internal inspection April, 2017

DHACI rating

lower duct: B

upper duct: 3





Lower Duct



81-month internal inspection April, 2017

DHACI rating

lower duct: B



Also in the Lower Duct....

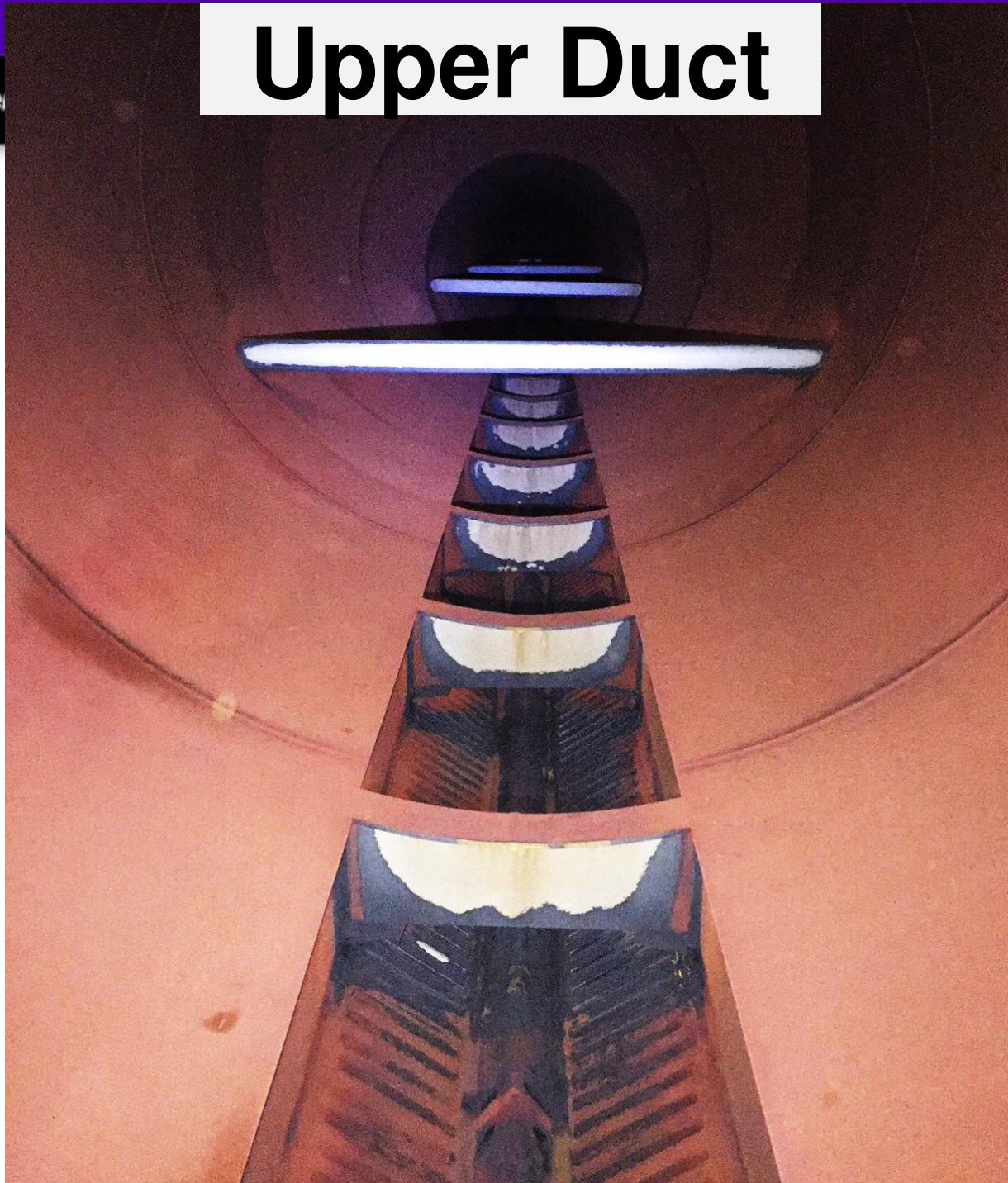
Also in the Lower Duct....



Also in the Lower Duct....

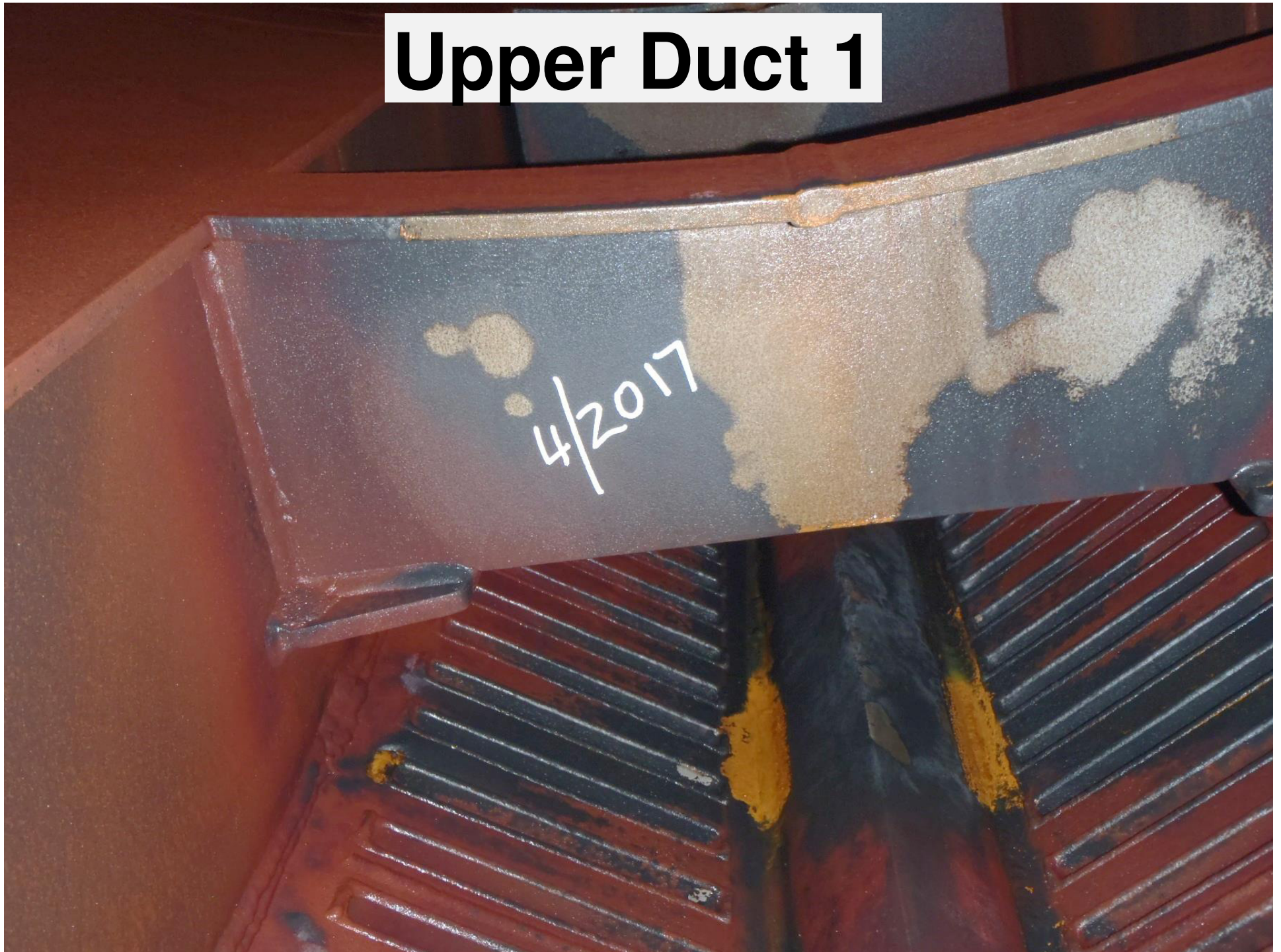


Upper Duct

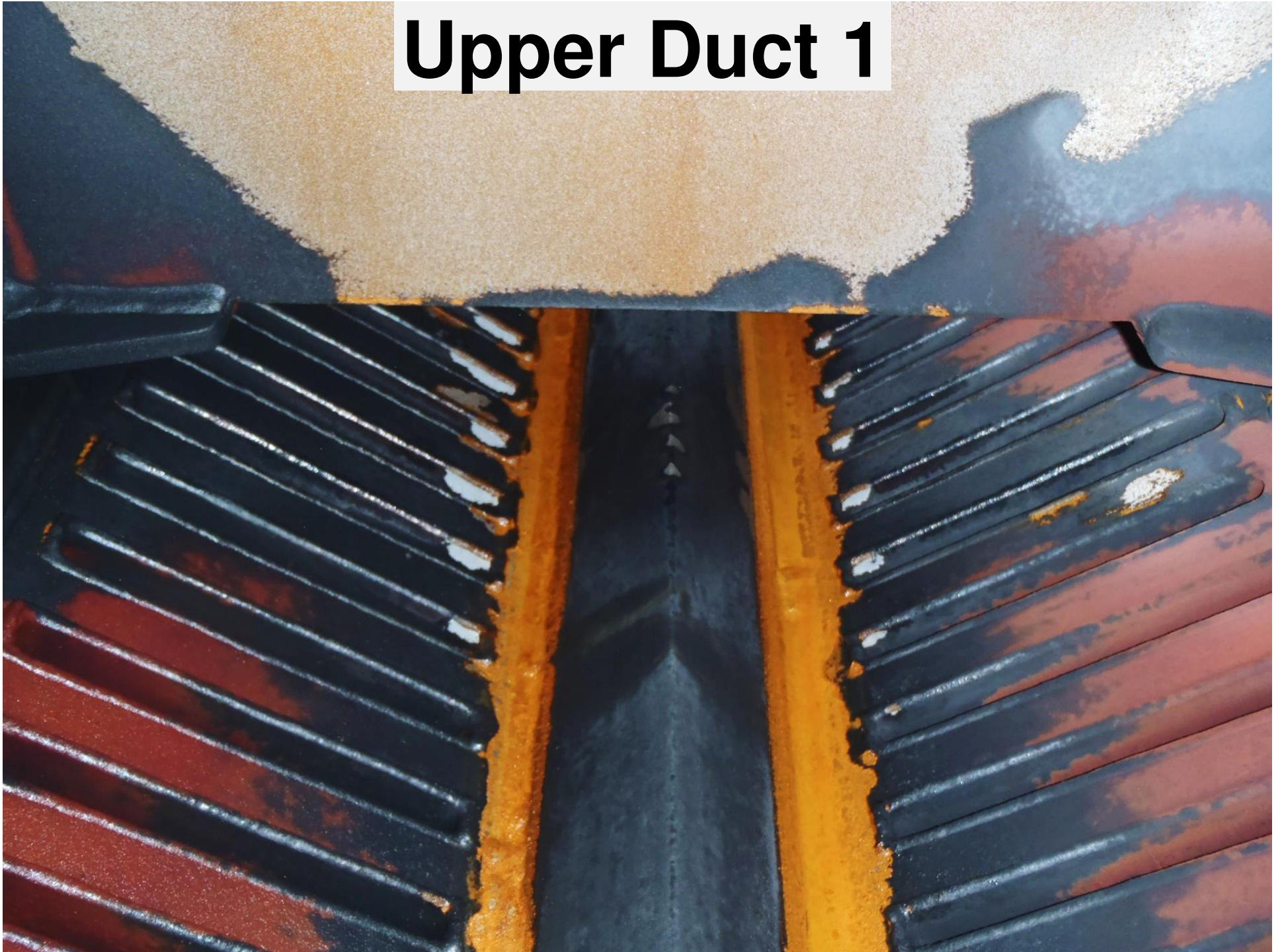


Upper Duct 1

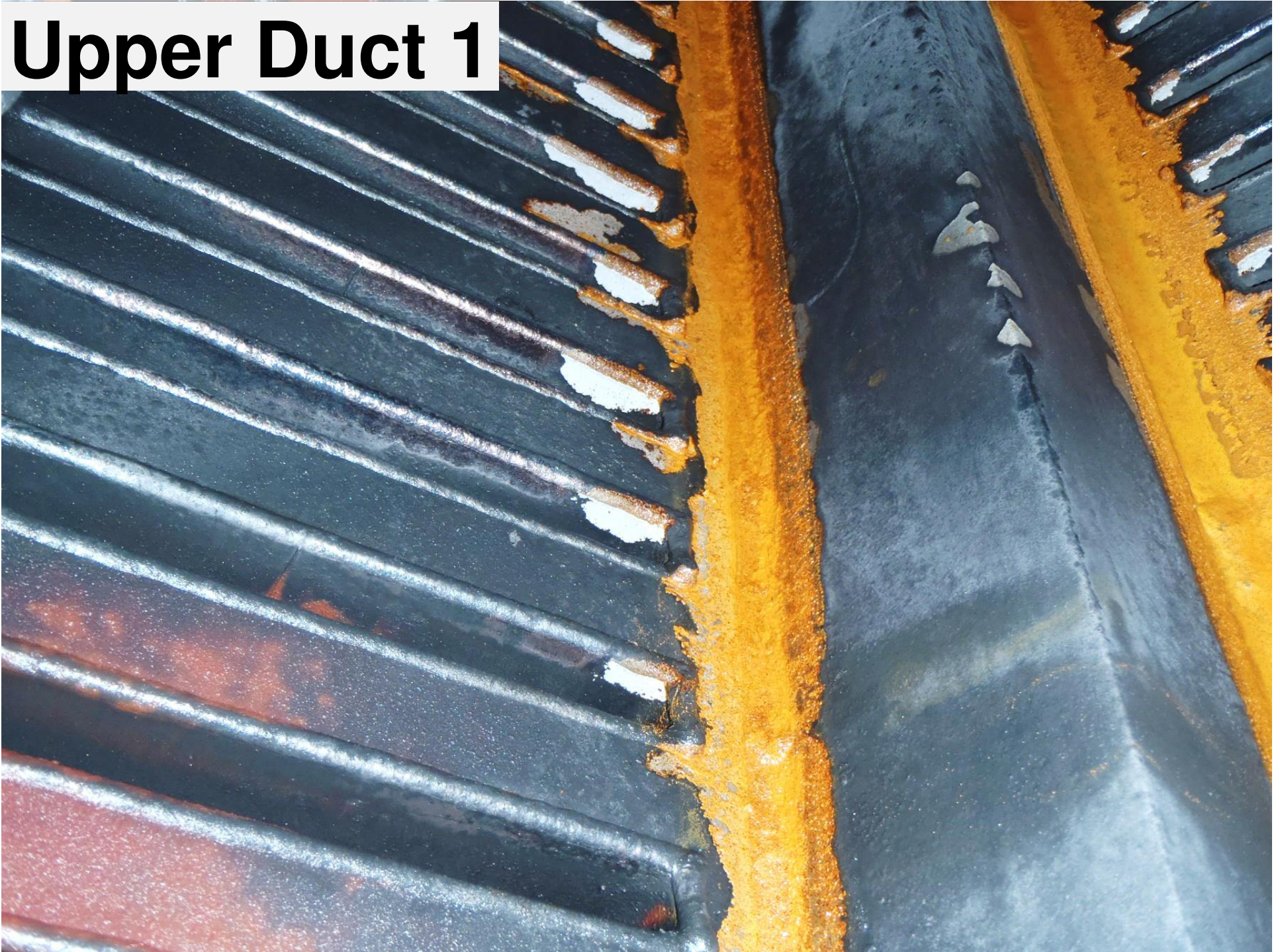
4/2017



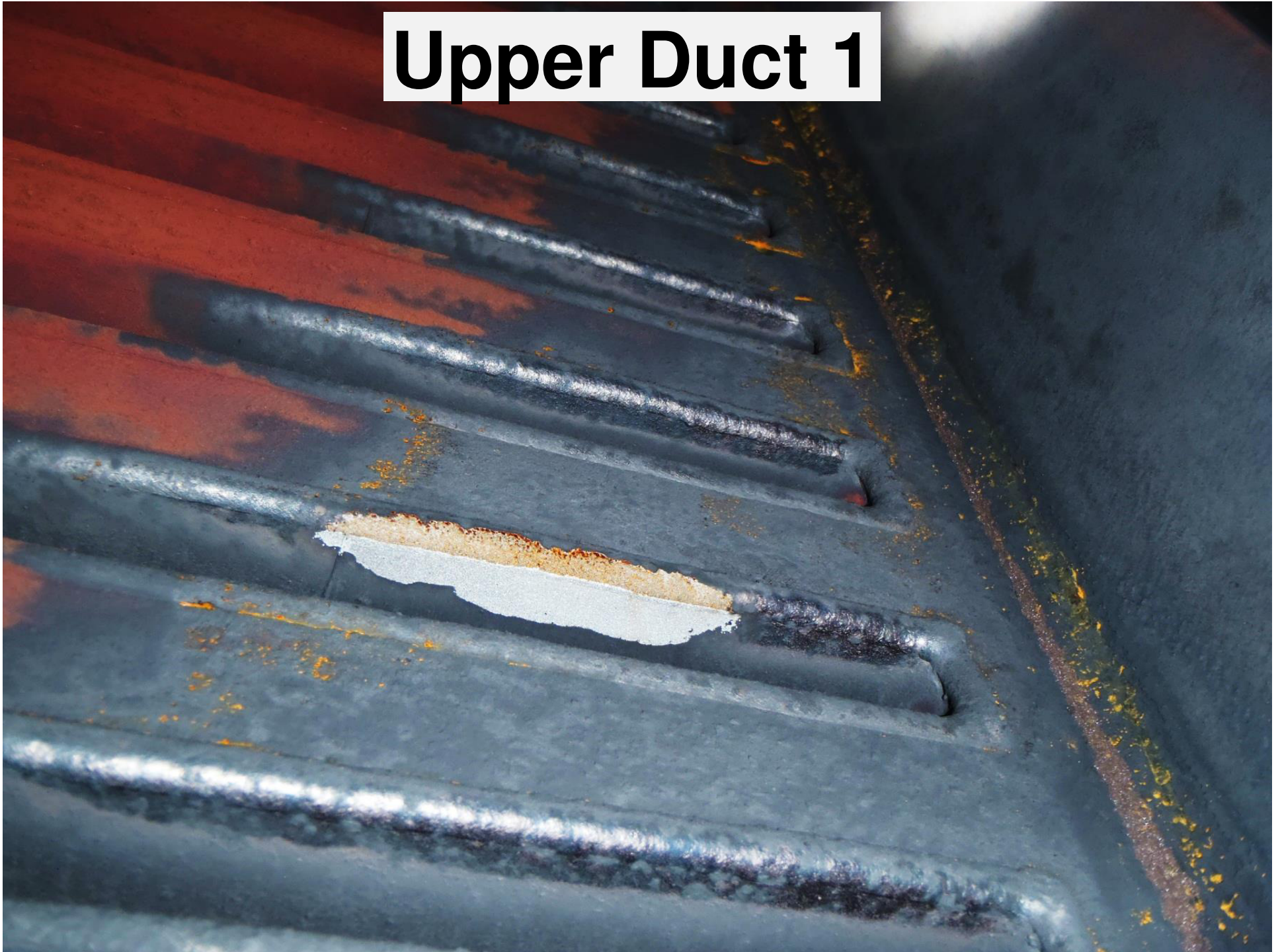
Upper Duct 1



Upper Duct 1



Upper Duct 1



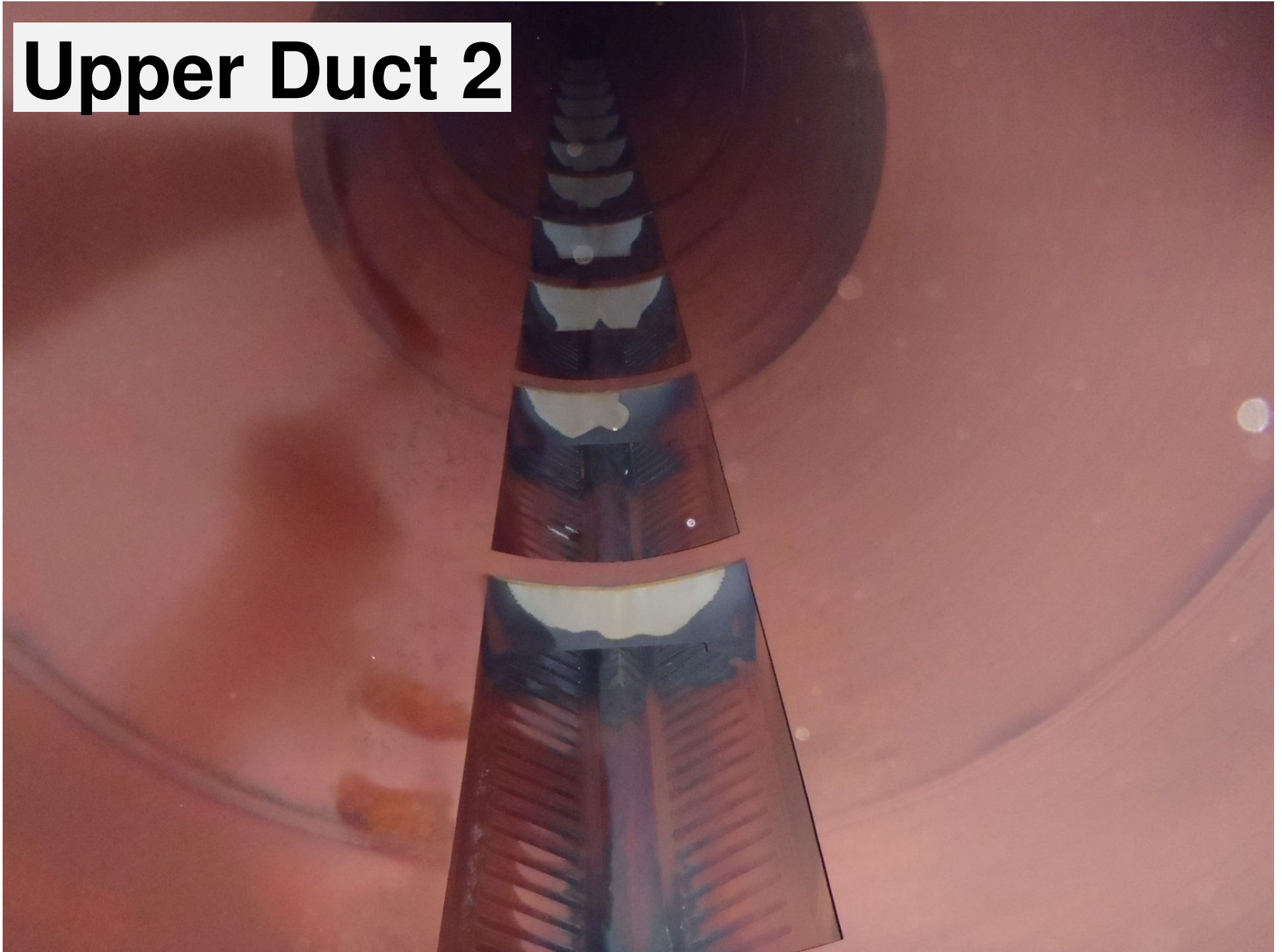
Upper Duct 2



Upper Duct 2



Upper Duct 2



Upper Duct 2



Upper Duct 2



Upper Duct 2



Upper Duct 2



81-month internal inspection April, 2017

DHACI rating

upper duct: 3

ACC HX Tube Wall Thickness UT

**0.200" measured
(spec. 0.059")**



ACC Corrosion Coupons:
Installed May 2017

**Coupons: carbon steel, 0.125" thickness
(tube ID 0.750", tube wall 0.059")**





- **With no chemistry pH limits change, DHACI has gone from 2 to 1 to 3 in Upper Duct (B-B-B in Lower Duct)**
 - **Other factors than pH may be responsible for changes in corrosion at tube entry**
 - or**
 - **changes in pH within limits of 9.45 – 9.60 may be sufficient to influence corrosion at tube entry**

Conclusions

- **ACC tube inlet corrosion has been inconsistent while steam cycle chemistry has appeared to be consistent.**
- **Options for evaluating tube corrosion, such as thickness testing and corrosion coupons, have been implemented at Comanche 3 and may prove useful towards addressing the issue.**

Questions?