

4. Bubbles



Nishikibashi Bridge 2009.6.12
middle tide



Sanage Bridge
photo: Goyousuiatogaienaigokai survey group



Nishikbashi Bridge 2009.6.23, Spring tide
photo: Kawasemi survey group

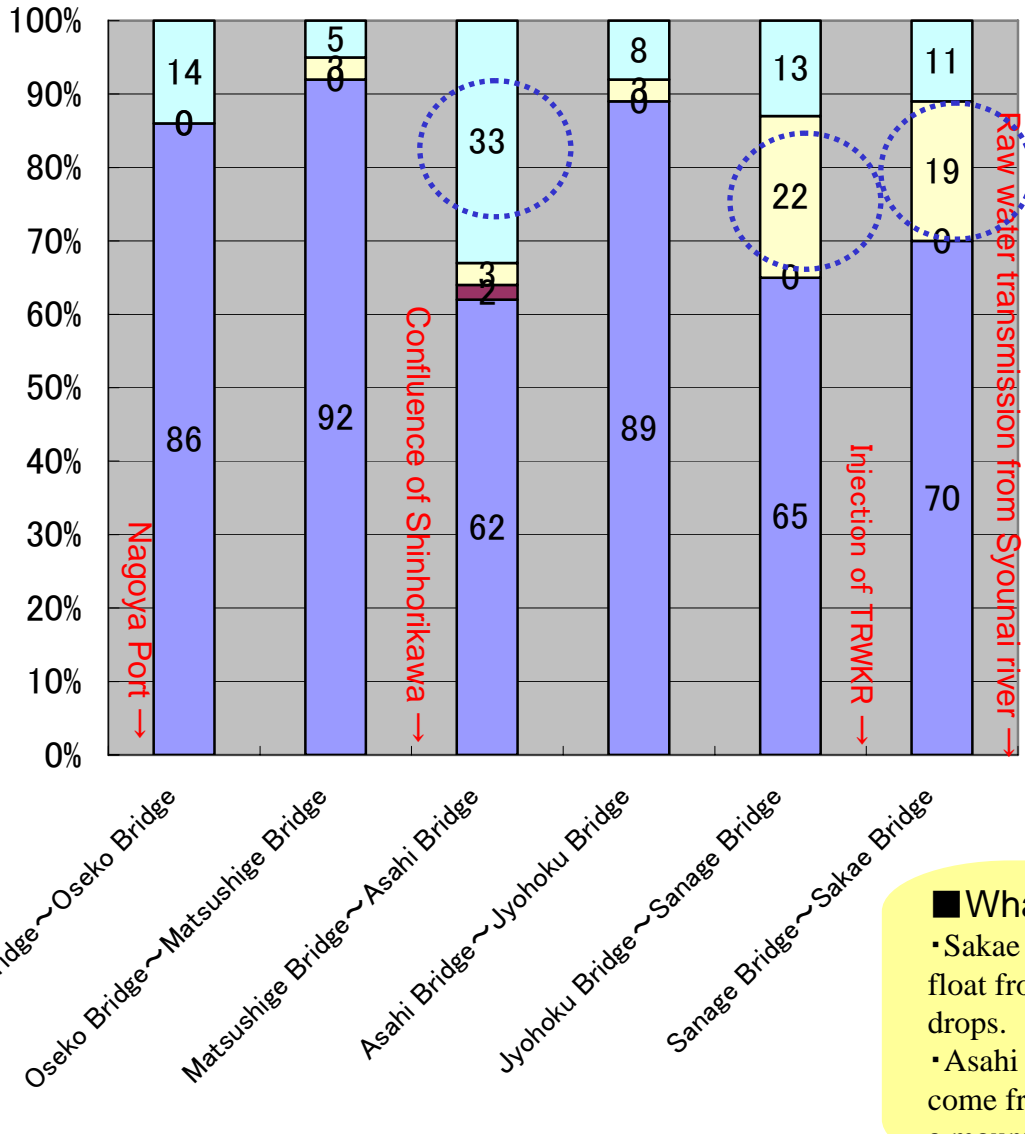


Shiga Bridge
photo: shinkou survey group

4.1. Generation status of bubbles

(vertical direction) 1st stage - 5th stage

General Status of Bubbles, Component Ratio(%)



(with TRWKR;
No rain : previous day
and current day)

- Bubbles come from the bottom of river
- Bubbles float from upstream site
- Bubbles float from downstream site
- No bubbles



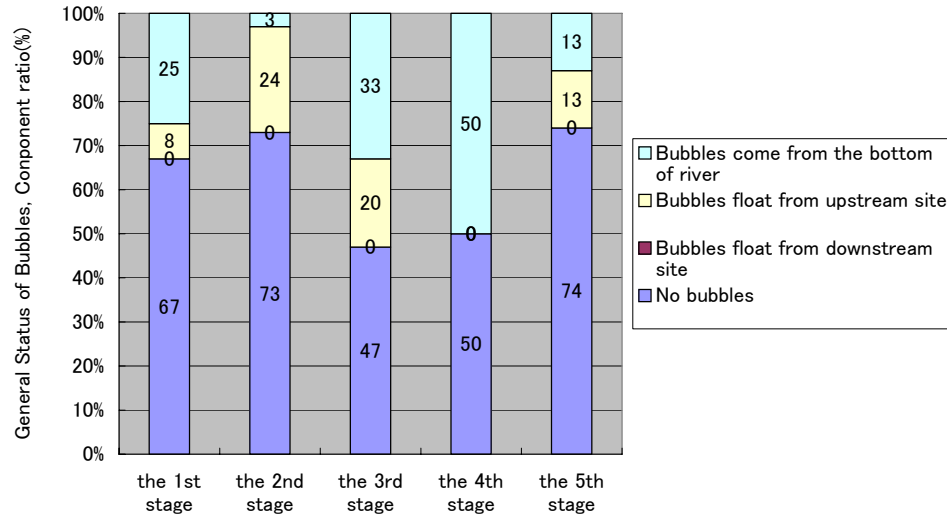
■ What kind of bubble ?

- Sakae Bridge – Jyohoku Bridge area; Bubbles float from upstream site. These bubbles result from drops.
- Asahi Bridge – Matsushige Bridge area; Bubbles come from the bottom of river. These bubbles result a mount of sludge at the bottom of river.

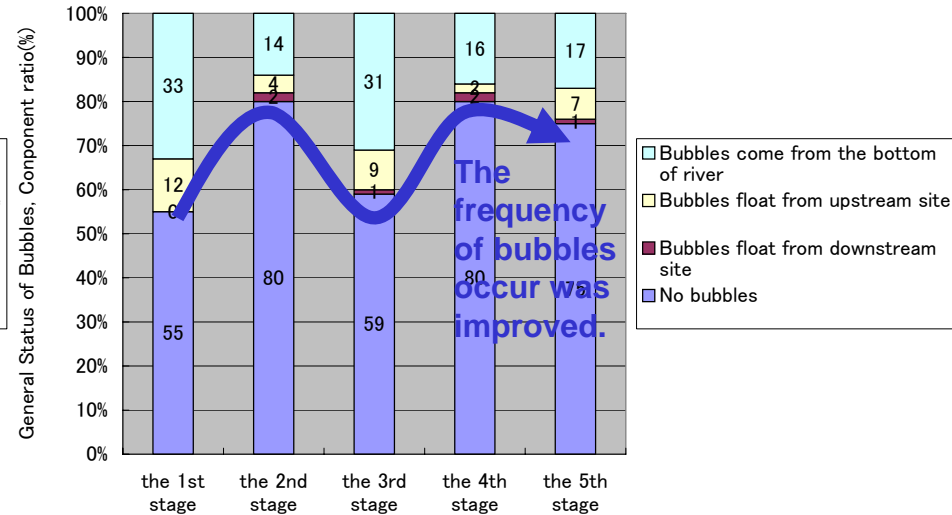
4.2. Generation status of bubbles (by district)

(with TRWKR; No rain : previous day and current day)

Sakae Bridge~Sanage Bridge



Sanage Bridge~Koushin Bridge



■ Difference of occurrence frequency of bubbles

(Sanage Bridge-Koushin Bridge)

- Compared with the 1st stage, the occurrence frequency of bubbles at the 5th stage decrease. (= change for the better)

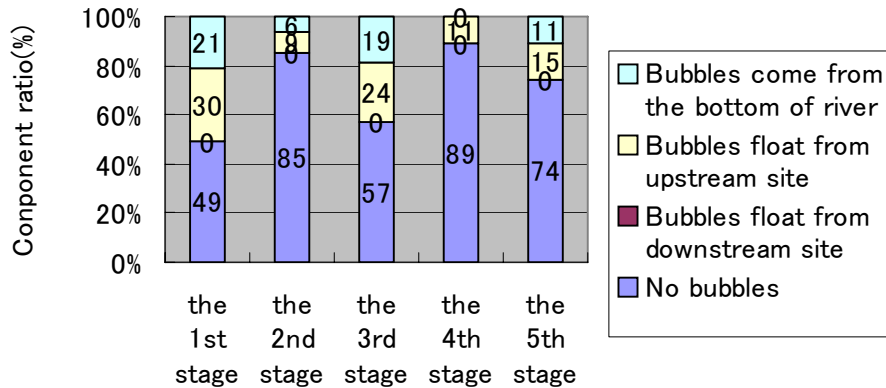
- The 1st, 3rd and 5th stage (spring – early summer), frequency of bubbles occur were more than the 2nd and 4th stage (fall – winter). The reason is that bubbles rise up from bottom of HR increase (= cause of sludge).



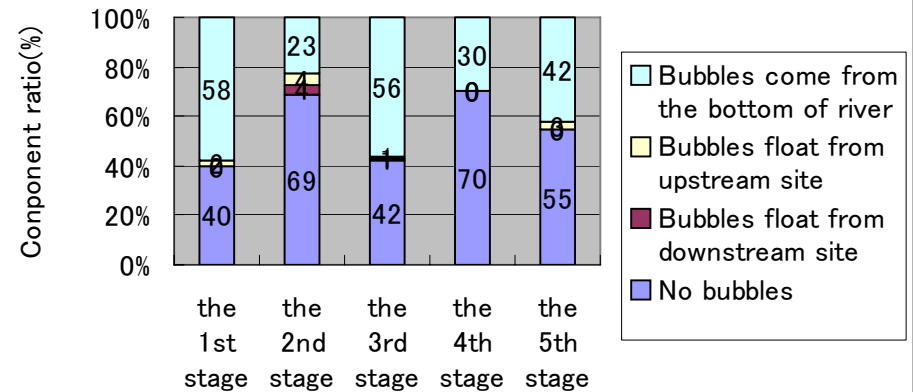
Generation status of bubbles

(Sanage Bridge – Kousin bridge ; by district)

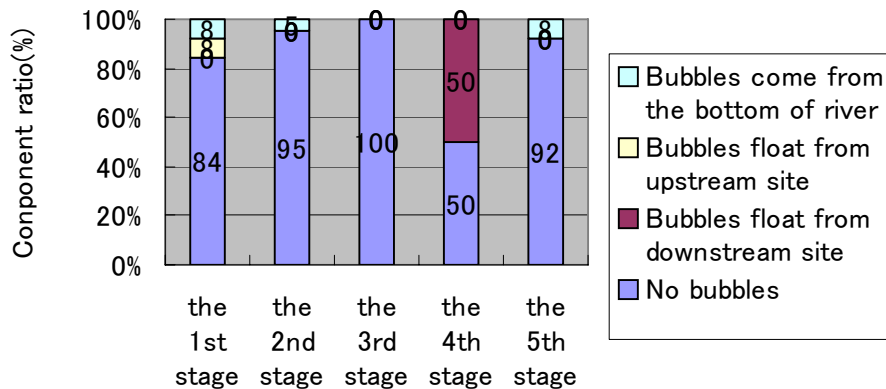
Sanage Bridge ~ Johoku Bridge



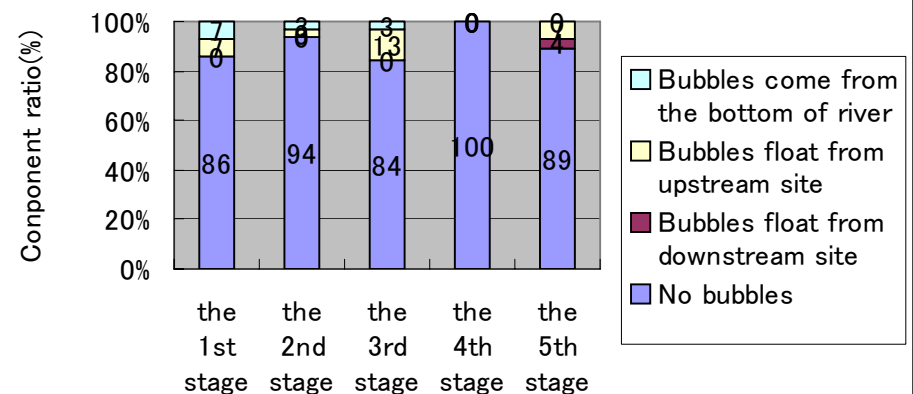
Asahi Bridge ~ Matsushige Bridge



Johoku Bridge ~ Asahi Bridge

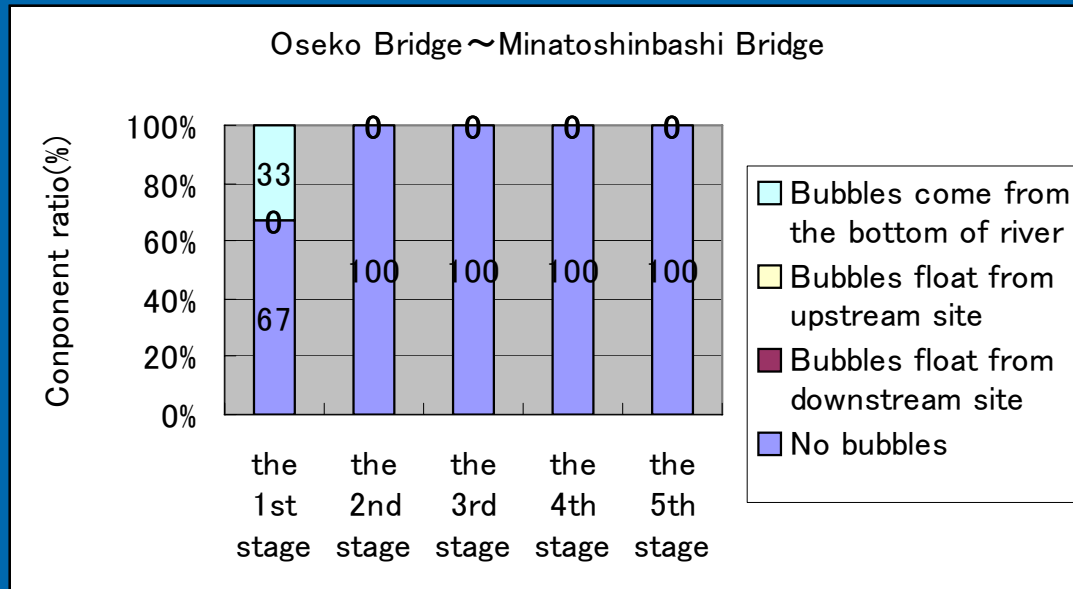


Matsushige Bridge ~ Oseko Bridge



Generation status of bubbles

(Sanage Bridge – Kousin bridge ; by district)



* Which area was the worst situation?

There are a lot of bubbles at Sakae bridge to Jyohoku bridge area. (case of drops : ex. Sanage bridge)

There are some bubbles from the bottom of river at Asahi bridge to Matsushige bridge area. We think that the reason is sludge.

The 5th stage at Sanage bridge to Jyohoku bridge area and Asahi bridge to Matsushige bridge area is better than the 1st stage (shortly after starting raw water transmission)

->occurrence frequency of bubbles decrease, change for the better, at Jyohoku bridge to Matsushige bridge area and Asahi bridge to Mastushige bridge area.

Column - About bubbles -

We HSC explain some observed bubbles from 1st stage to 5th stage.

We organized our research results each area. (ref. 4.1.)

There were some bubbles from upstream site at Sakae bridge to Jyohoku Bridge area. We think the cause was drops ,as shown in example of Sanage bridge.

Furthermore, bubbles from the bottom of river at Asahi bridge to Matsushige bridge area were more than other area. We think the cause was a mount of sludge at the bottom of river.

Next, We classified generation status of bubbles each stage. (ref. 4.2.)

These survey found that occurrence frequency of bubbles at the 5th stage decreased compared with the 1st stage, occurrence frequency of bubbles in spring and early summer is higher than in fall and early winter.



In addition, We classified generation status of bubbles each stage and area. (ref. 4.3.)

These survey found that occurrence frequency of bubbles at Sanage bridge to Jyohoku bridge, Aasahi bridge to Matsushige bridge of the 5th stage decreased compare with the 1st stage.

Additional Notes

The amount of bubble thought to be causally related sludge is influenced by accumulated sludge, water temperature, air temperature and sea tide etc.

*About the Influence of sea tide

(example) drawdown: Bubbles are produced by the release reduced water pressure.

increase the flow rate: Bubbles are produced by mixing a mount of sludge.