



TOGETHER FOR INNOVATION

Specifics of Cleaning an Induced Draft Air-Cooled Condenser

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Agenda

Why and how to clean an ACC:

- Origin of fouling

- Best cleaning practices for best ACC efficiency

Specifics of induced draft ACC:

- Specifics of induced draft heat exchangers

- Related induced draft ACC Cleaning solutions





ACC cleaning : why to clean?

FOULING origin & Effects on Performances





Where does the fouling come from?

Pollen



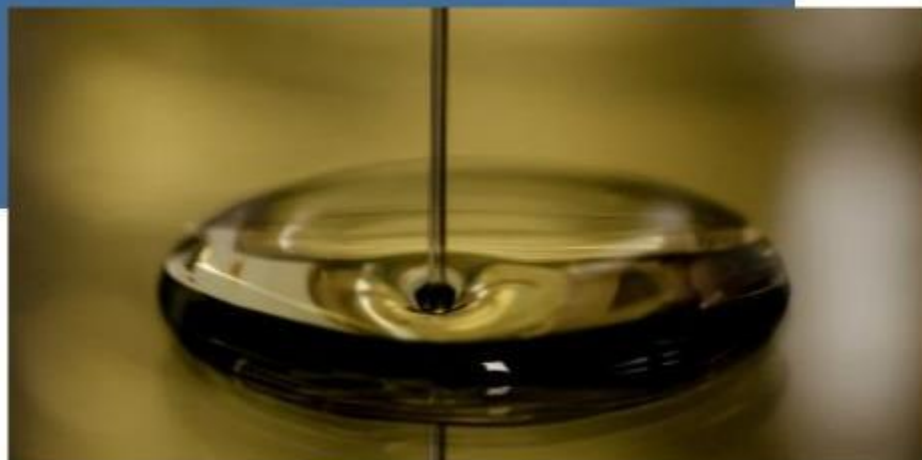
Bird dropping



Sand



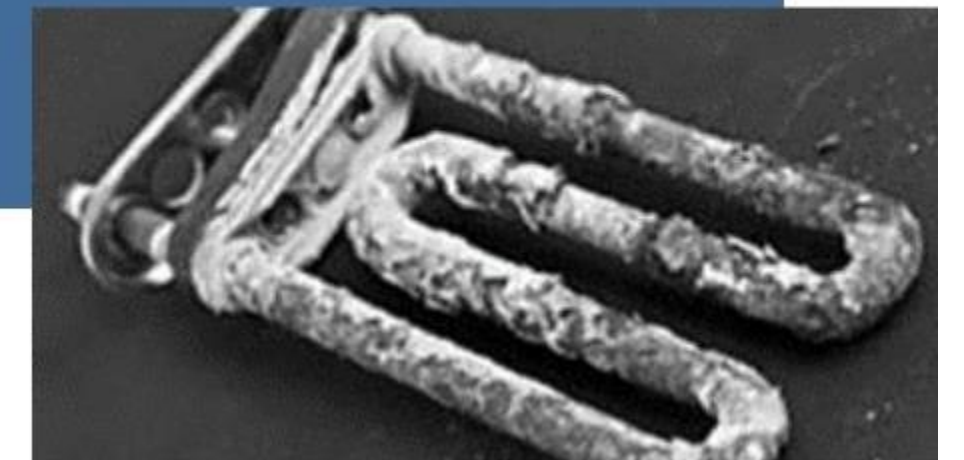
Oil spillage



**Fiber Dust
Industrial particles**

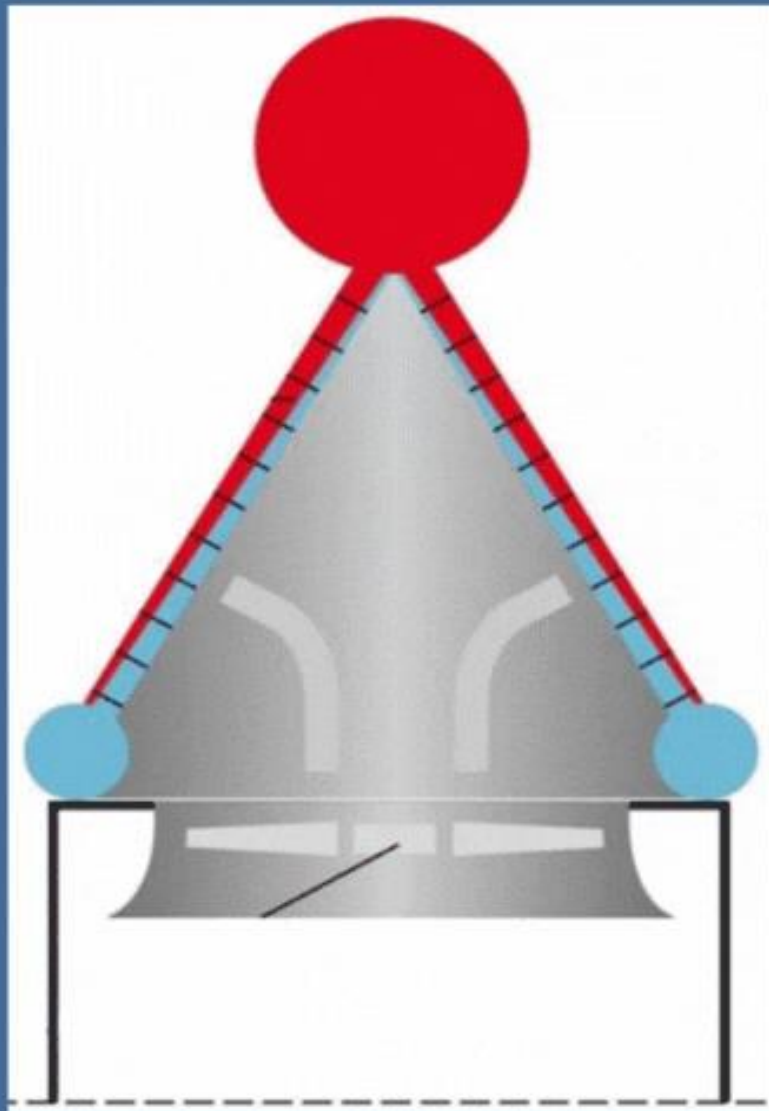


Limescale/Calcium





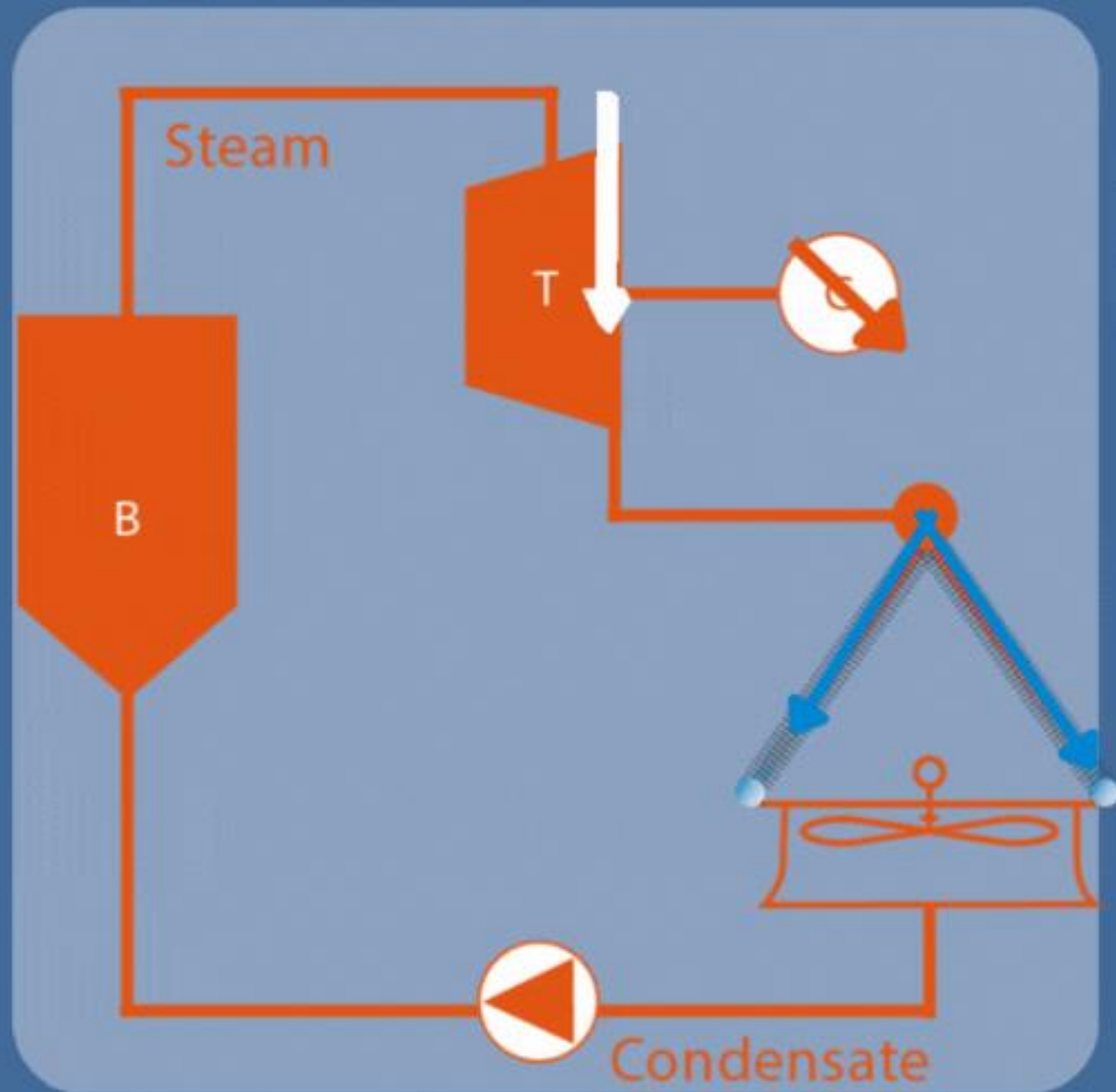
Fouling's effect on performance (1/2)



- Create an isolation film
- Reduce the Air Flow through the fins
 - Heat transfer is dropping



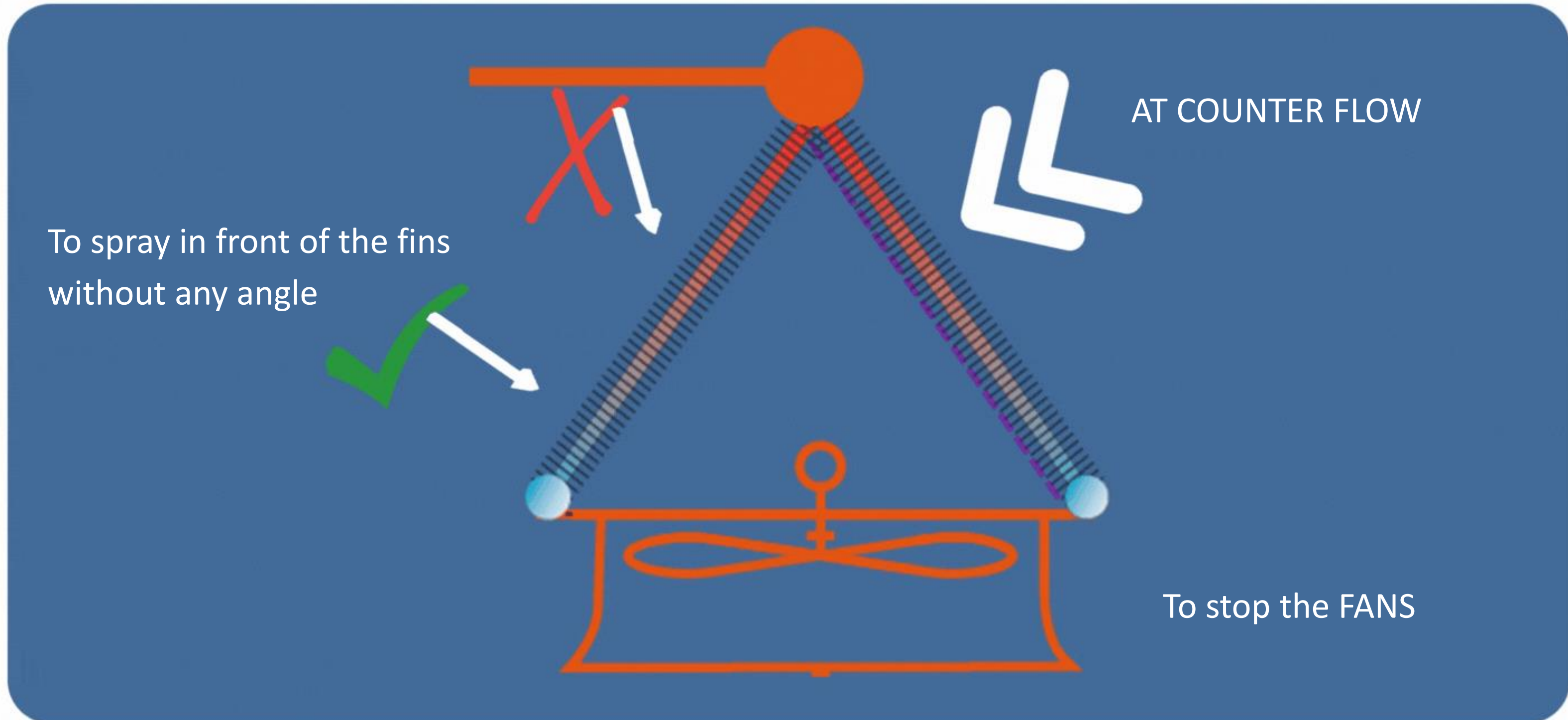
Fouling's effect on performance (2/2)



- Vapor condensates into water slower.
- Vacuum level in ACC drops
- Vapor flow rate in the turbine drops
- Turbine turns slower and produces less electricity
- Efficiency has to be optimised to get back earnings.



How to clean?





ACC Cleaning

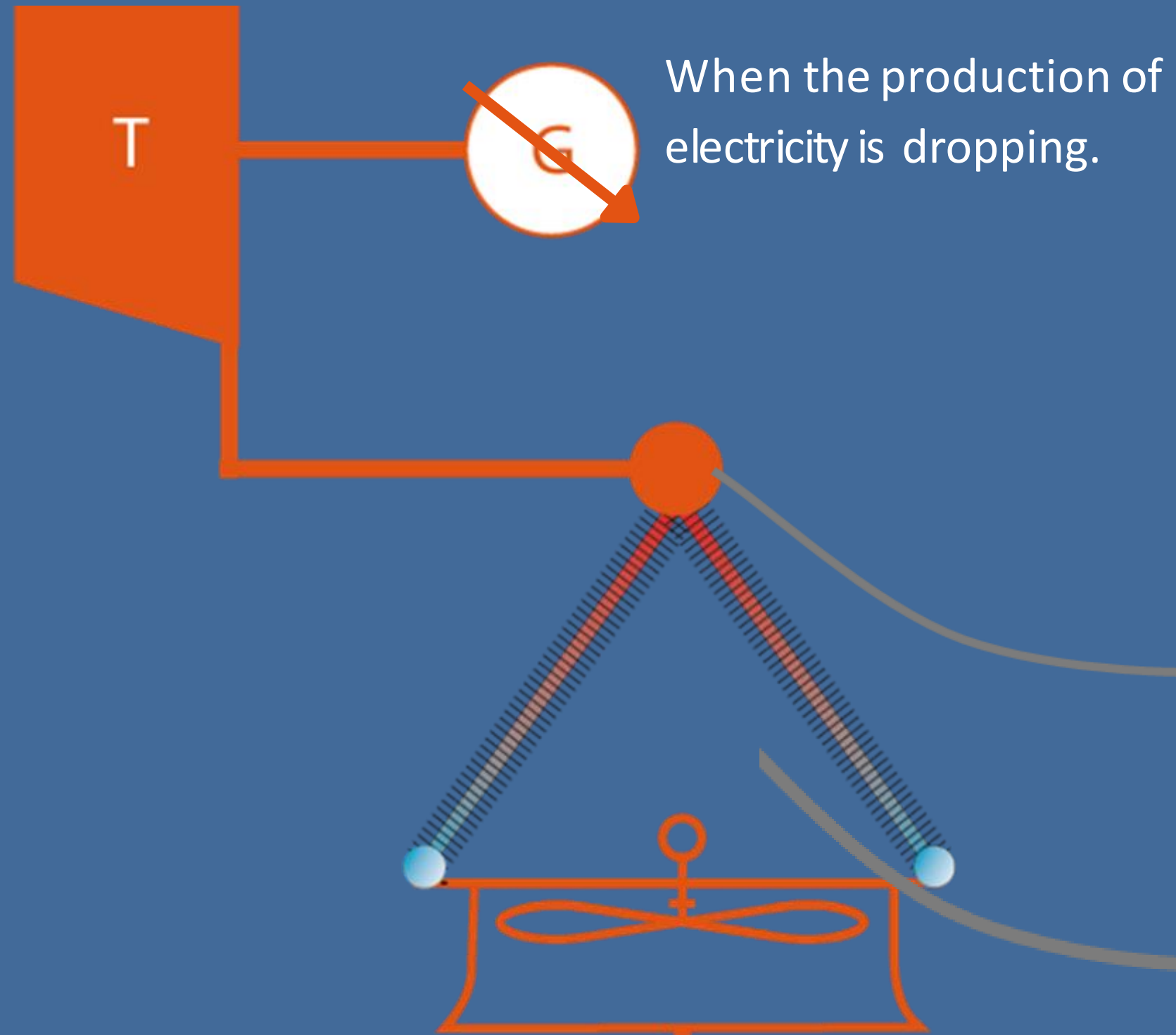


When and How to clean





When to clean (1/2)



INSIDE Visual control :if the fouling is visible



When the vacuum level in ACC is dropping



When internal static pressure rises (measured by a differential pressure)



When to clean (2/2)

We recommend to clean:

- Periodically: more often you clean, easier it is!
- At least once a year, after pollen season (depending on the area and environment)



How ~~not~~ to clean and why?



Manuel HP cleaner



Risk to fold the fins.



In sand blasting



It can damage the fins, and remove the aluminium coated.



In sodium bi-carbonate blasting



There's a risk of electrolyse effect between Aluminium and NaHCO_3 which may damage the fins

Specifics of Induced draft Air cooled condenser



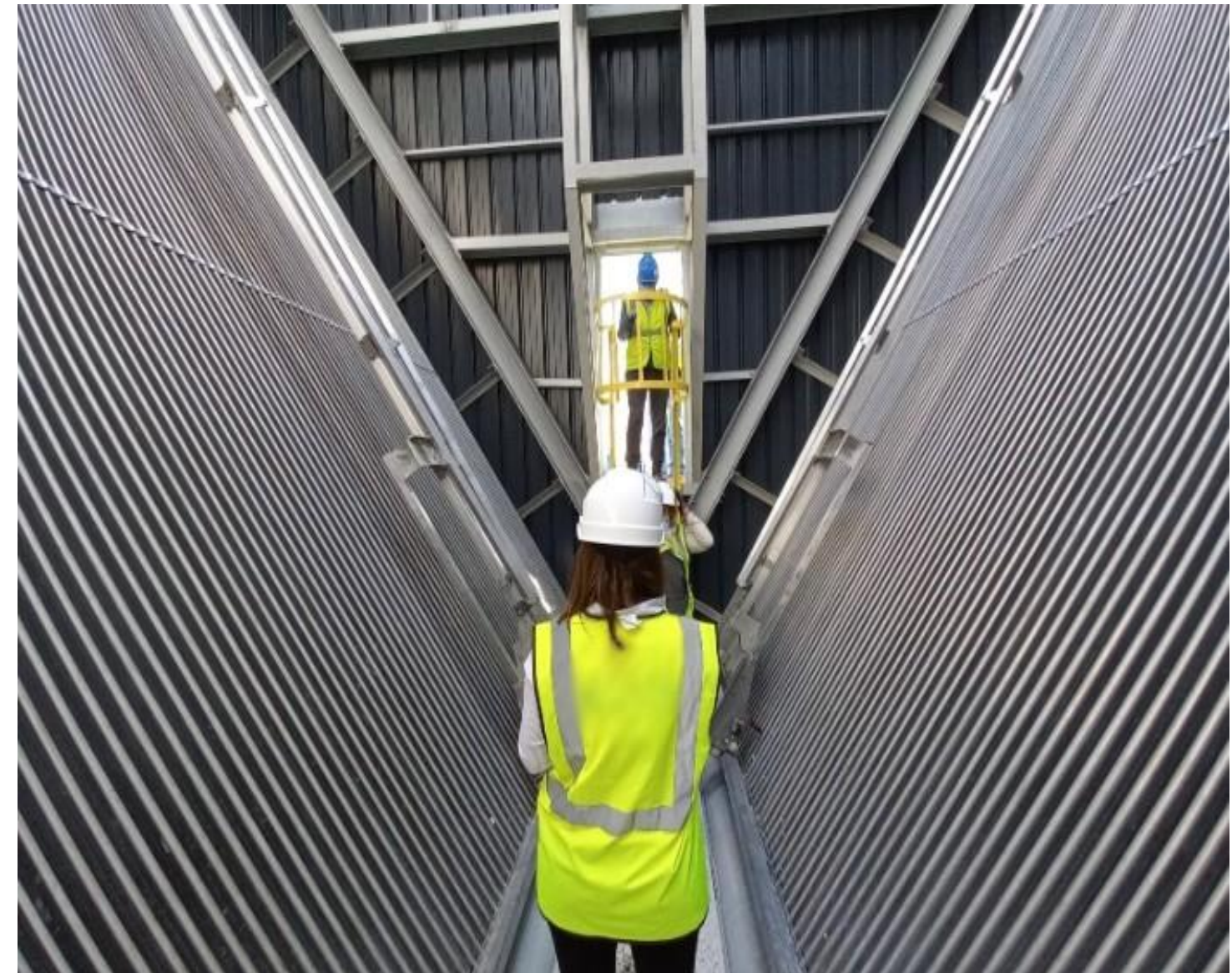


Specifics of Induced draft ACC cleaning system

Induced draft ACC have there own specifics:

- Cell partition:
- Structure:
- ACC streets/walkways with obstacles: ladders to access each cell or equipment (vertical fan axles, cable trays)

Such specifics induces adapted cleaning systems solutions to ensure the correct performance of the ACC





Specifics of Induced draft ACC cleaning system

Induced draft specifics:

- Partition cells

Solution:

- Cleaning rigs crossing interconnection doors (as Towantic)



To minimize cleaning rigs quantity and avoid to place one cleaning rig per side of each cell, interconnection doors enable the transfer the cleaning rig from cell to next ones.



Handling of these doors and cleaning rigs translation are critical.

On the cleaning rig, it is then important to minimize the distance between the operator with the cleaning system bottom trolley to ensure the easiest and the smooth cleaning rigs translation



Specifics of Induced draft ACC cleaning system

Induced draft specifics:

- No partition doors due to the ACC structure

Solution:

- Fix vertical cleaning rigs and large span cleaning heads.



Classical semi automatic system alternative, the system have the following specifications:

- The vertical cleaning rigs are replaced by vertical rails
- One specific cleaning head : Large span with multiple portions to be activated
- One cleaning motion device shared for all ACC





Specifics of Induced draft ACC cleaning system

Induced draft specifics:

- ACC streets/walkways with obstacles: ladders to access the cell or equipment (vertical fan axles, cable trays)

Solution:

- All components on the cleaning rigs to avoid any collision with the equipment.





Conclusion



Aside to the combination to the cleaning system challenges (low consumption, easy handling and maintenance, automated operations)



Induced draft ACC have it own specifics, adapted cleaning systems ease cleaning operations to maintain best ACC performance years after years.





A-FRAME ACC



V-FRAME ACC



VERTICAL ACC



FLAT HEAT EXCHANGER



MODULAR ACC



A solution for you



Thank you for your
attention !