Step-by-Step: The Higg FEM Verification Trail
Section 6: Air Emissions

March 3rd, 2020

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Leadership & Sustainability

Meet our Speakers

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Has completed > 30 Higg FEM verifications

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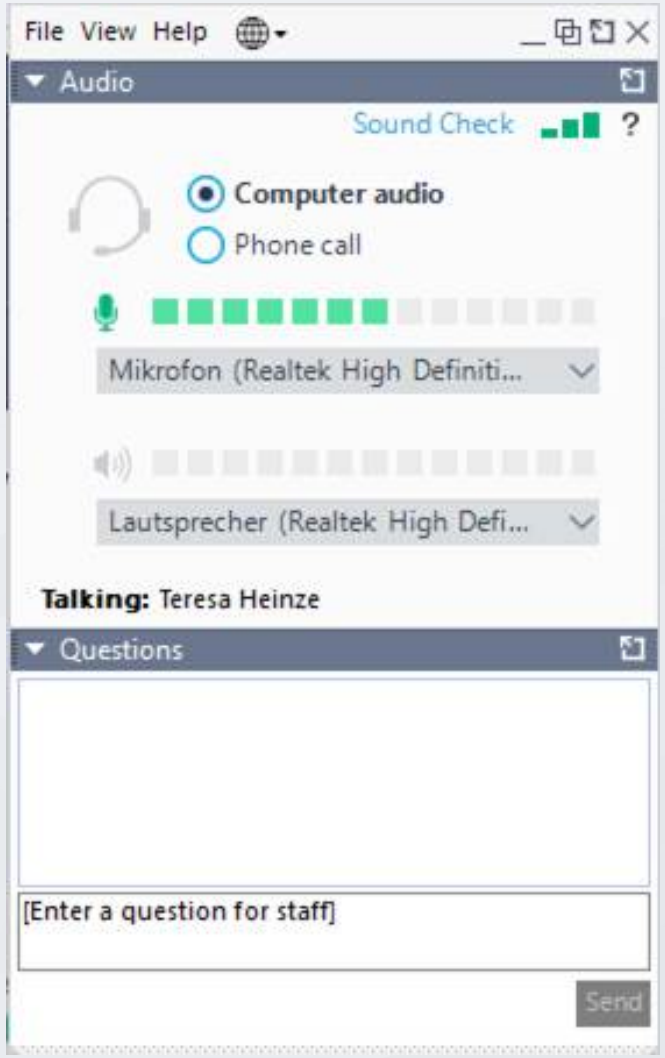
Verification Coordinator

Using GoToWebinar
Control Panel

- During this webinar the audience will be muted, in order to ensure best audio quality
- Please feel free to send us questions during the presentation, via the Questions function
- In a follow up e-mail, we will provide a link to a recording of this webinar and a link to download the presentation



Click the drop down arrow to open "Questions"

Type your question

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Agenda

1. Verification Trail & Purpose
2. Section 6: Air Emissions
3. Questions and Discussion
4. Added value & FEM training offer
5. About Leadership & Sustainability

The Verification Trail and its Purpose

Leadership & Sustainability

Verification Trail – Purpose

- Gaining better understanding of Higg Index and Higg FEM in particular and its **meaning** for your company
- Section-wise guidance through all processes
- Becoming acquainted with the requirements

Verification Process – Overview

Complete self-assessment, FEM

1

2

Engage verifier

Provide information on

- Type of factory
- No. of employees
- Use of chemicals in production
- Chemical level reached
- Wastewater treatment
- Address of factory

Make self-assessment, vFEM, available to verifier

3

4

Verifier to review documents & inform about issues beforehand

Verifier sends agenda ahead of on-site visit

5

6

On-site/ off-site Verification

Reporting, posting results on Higg.org

7

Guidance from SAC about on-site verification available here: on-site verification

General Advice

- **Appoint a person** who is responsible
- Read the "How to Higg" and the Verification Preparation guidance
- Respond **accurately** to the questions
- **Documentation**
- **Targets and baselines**
- Be aware of the **time** needed
- Ultimate goal is to **improve** every year

Verification Trail – Next Step

1. Facility Information & Permits
2. Environmental Management System
3. Energy & GHG
4. Water Use
5. Wastewater
6. Air Emissions
7. Waste
8. Chemicals Management

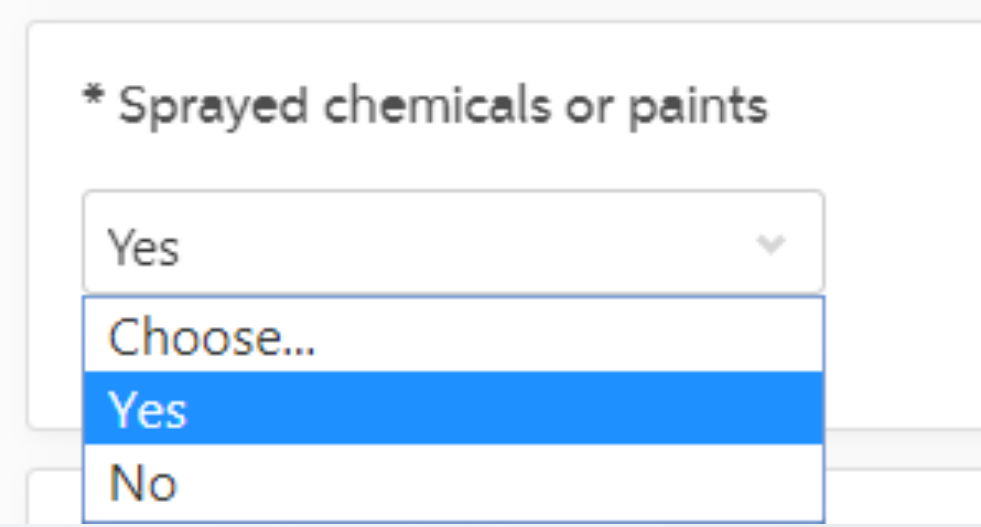
Section 6: Air Emissions

Air Emissions – Applicability

Ensure correct Applicabilities

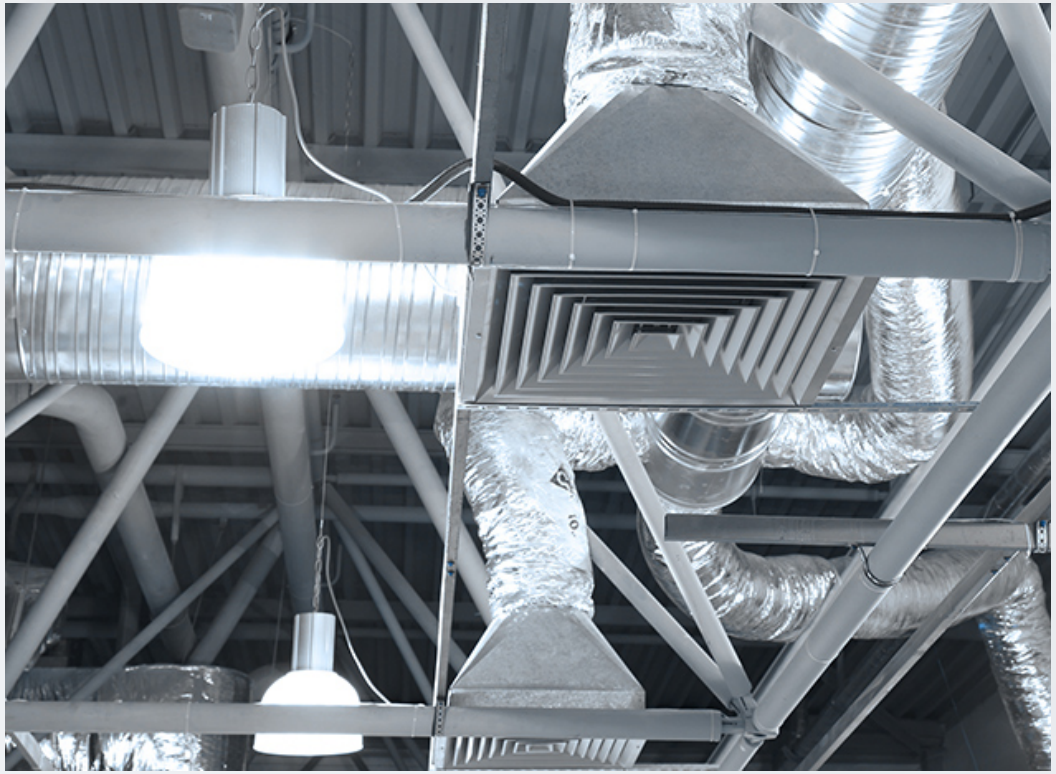
- Processes
  - Printing, Drying, Dyeing, etc.
- Supporting Facilities
  - Generators, boilers, industrial ovens, air conditioning etc.
- Other sources of ozone depleting substances
  - Chillers, refrigerators, etc.

Air Emissions – Applicability



- Process that includes spray
  - Such as
    - Potassium permanganate (PP) spraying units
    - Footwear assembly units which use spraying systems to color the soles
    - Softening spraying units

Air Emissions – Applicability



- **Indoor / outdoor emissions**
  - **Indoor**
    - Printing, adhesive process, spot cleaning, etc.
  - **Outdoor**
    - Fuel consumption, spinning, dyeing, etc.

Air Emissions – Levels

- **Level 1:**

1. Operations emissions tracking
2. Production processes emissions tracking
3. Refrigerants
4. Control devices - Operations
5. Control devices– production processes

- **Level 2:**

6. Managing emissions beyond permit

- **Level 3:**

7. Modernizing equipment

Source: How to Higg Guide 3.1

Air Emissions – Level 1

- **Select all sources of air emissions** (**Q1**)
  - Emission that are not regulated by a permit.
  - Emission that is not in compliance with its permit.
  - This question excludes emissions from production processes.

Air Emissions – Level 1

- **Example Air Emissions Inventory Table**

Air Emissions Inventory

Factory ABC

ID Number	Emission Source	Pollutants Emitted	Concentration	Determined by	Control Devices In Place	Applicable Regulations	Testing Required
PS - 1	500 kW Diesel Power Emergency Generator S/N - 123456	Total Hydrocarbons (THC)	5 tons/year	☐ Measured ☑ Calculated	NA	Technical Memorandum to issue Air Pollution Abatement Notice to control Air Pollution from Stationary Processes	No testing required per regulation as generator run time is less than 200 hours annually.
		NOx	60 tons/year				
		PM2.5	4.2 tons/year				
		CO	13 tons/year				
		SOx	4 tons/year				
PS - 2	125 kW Diesel Power Emergency Generator S/N - 987654	Total Hydrocarbons (THC)	3 kg/year	☐ Measured ☑ Calculated	NA	Technical Memorandum to issue Air Pollution Abatement Notice to control Air Pollution from Stationary Processes	No testing required per regulation as generator run time is less than 200 hours annually.
		NOx	30 kg/year				
		PM2.5	2.4 tons/year				
		CO	9 tons/year				
		SOx	2 tons/year				
PS - 3	Wood Fired Steam Boiler	SO2	10 kg/year	☑ Measured ☐ Calculated	NA	ANK-42-00 ANUKRET ON AIR POLLUTION AND NOISE DISTURBANCE CONTROL	Per regulation, stack testing is required on annual basis and must meet emission discharge limits.
		NOx	300 kg/year				
		PM2.5	240kg/year				
		CO	24 kg/year				
		THC	15 kg/year				

You can download an example inventory here.

Source: GSCP

Air Emissions – Level 1

- **Select all sources of air emissions that result from production processes** (Q2)
  - Indoor air pollution
  - Fugitive sources
  - Indoor air quality testing
  - VOCs content in sprayed chemicals

Air Emissions – Level 1

- **Select all sources of air emissions that result from production processes** (Q2)

  Suggested upload:

  - An inventory of emissions to air for all sources of emissions from production processes.
  - Records (test records or estimations) detailing how the quantity of emissions reported were calculated.

Air Emissions – Exercise 1

- VOCs emission calculation from spot cleaners (**Q2**)

Example:

- **VOCs Content:** 1 mg/l (from VOC test report of spot cleaner)
- **Consumption:** 100 liter in 2018

- **100 liter x 1 mg/liter = 100 mg**

Result: 100 mg VOC in 2018

Air Emissions – Exercise 2

- The facility has worked **300 days in 2019**.
- The facility's VOCs and PM results are in dyeing area:
  - **VOCs: 0.5 mg/m3**
  - **PM: 0.5 mg/m3**
- Air flow: **30,000 m3/day**

Please **calculate** the facility's PM and VOCs fugitive emission in 2019.

0.5(mg/m3/day)*300(day/year)*30,000(m3/day)

= 4,500,000 mg/year = 4.5 kg / year each

Air Emissions – Level 1

- **Refrigerants** (Q3)
  - Air Condition
  - Chillers
  - Refrigerators
  - Hand-held fire extinguishers

Air Emissions – Level 1

- **Control devices** (**Q4 and Q5**)
  - **On-site** Air Emission
    - Dust collector
    - Bag filter
    - Wet Scrubbers
  - **Indoor** Air Quality
    - Fume hood
    - Solvent recovery
    - Local exhaust ventilation

Air Emissions – Level 2

- **Has your facility gone beyond permit requirements to achieve a higher level of air performance in Nitrogen Oxides (NOx), Sulfur Oxides (SOx), and Particulate Matter (PM)? (Q6)**

Small (less than 50 MW)		Level 1 Foundational	Level 2 Strategic	Level 3 Aspirational
	PM	150	100	50
	SO2	2000	1000	400
	NOx	650	300	200

Source: **How to Higg Guide 3.1**

(Unit of measure: mg/Nm3)

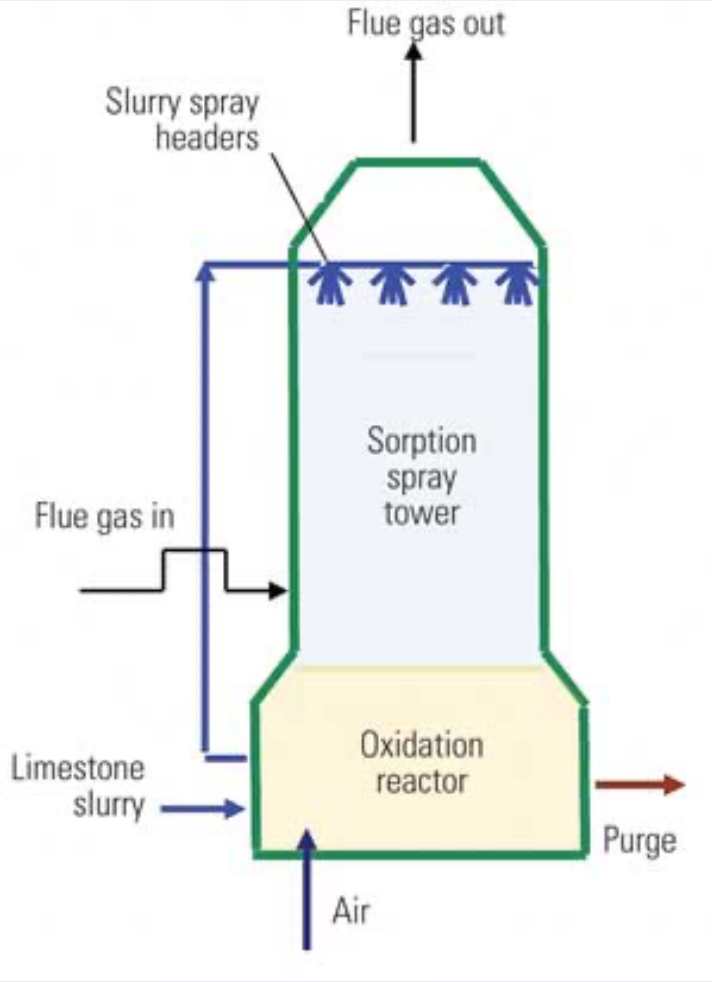
Air Emissions – Level 2

How to achieve a higher level of air performance (Q6)

- **Cleaner Energy Source**
  - Natural Gas
  - Renewable Energy
- **Air Pollution Control Systems**
- **Management such as:**
  - Improving efficiency of the conversion of fuel to electricity
  - Removal of sulfur from coal before combustion

Air Emissions – Level 2

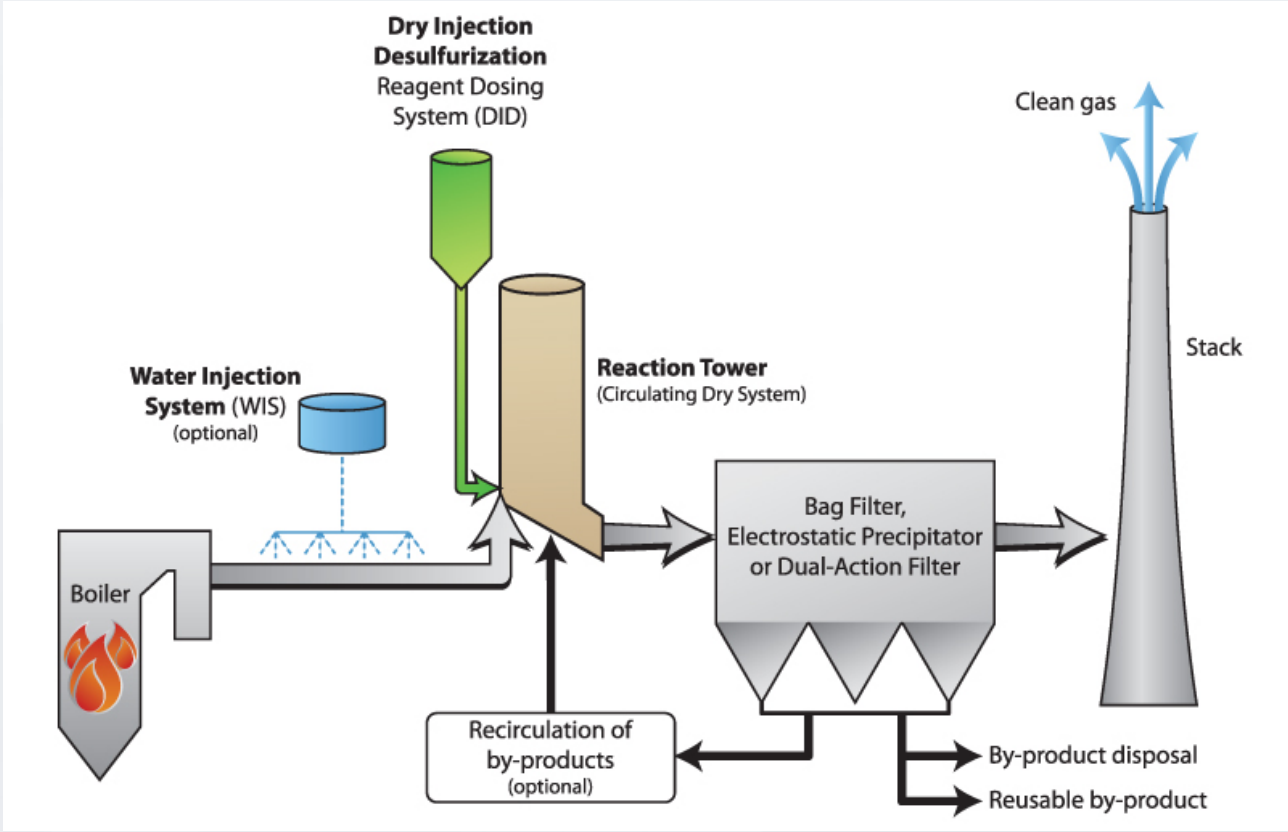
- **Air Pollution Control Systems** (Q6)
  - SO2 control
    - Flue Gas Desulphurisation - Dry or wet scrubbing



Source: powermag.com

Air Emissions – Level 2

- **Air Pollution Control Systems** (Q6)
  - NOx emissions
    - Flue Gas Treatment - Catalytic filter



Source: redecam.com

Air Emissions – Level 2

- **Air Pollution Control Systems** (Q6)
  - Particulate emissions
    - Chimney top electrostatic precipitators (ESP)
    - Fabric filters (baghouses)
    - Mechanical/inertial collectors (cyclones/ multicyclones)
    - Wet particulate scrubbers

Source: https://energyeducation.ca/

Air Emissions – Exercise 3

- The facility's emission results are:
  - PM : **75 mg/Nm3**
  - SO2: **1,200 mg/Nm3**
  - NOx: **250 mg/Nm3**
- Which **level** did the facility achieve?
  - **Level 1**

Small (less than 50 MW)		Level 1 Foundational	Level 2 Strategic	Level 3 Aspirational
	PM	150	100	50
	SO2	2000	1000	400
	NOx	650	300	200

(Unit of measure: mg/Nm3)

Air Emissions – Level 3

- **Modernized equipment** (Q7)

Question:

Do you have a process for implementing modernized equipment to reduce or eliminate air emissions and indoor air quality issues at your facility?

Air Emissions – Level 3

- **Modernized equipment** (Q7)
  - Replacing equipment
  - Substituting
    - ODS with more environmental friendly refrigerants
    - Cleaner fuel
  - Modifying existing equipment
  - Optimizing abatement equipment
  - Reduce emissions

Questions & Discussion

Added Value - Implementing the Higg FEM

Leadership & Sustainability

Countries, where we offer Higg FEM training & verification

A-L

Albania
Algeria
Australia
Austria
Bangladesh
Belgium
Benin
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
Burkina Faso
Burma
Cambodia
Canada
China
D.R. of the Congo
R. of the Congo
Cote d'Ivoire
Croatia
Cyprus
Czechia
Denmark
Djibouti
Egypt
El Salvador
Eritrea
Estonia
Ethiopia
Finland
France
Gabon
Georgia
Germany
Ghana
Greece
Guinea
Hong Kong
Hungary
Iceland
India
Indonesia
Ireland
Israel
Italy
Jordan
Kenya
Kosovo
Kuwait
Latvia
Liechtenstein
Lithuania
Luxembourg

Languages: English, German, French, Portuguese/English, Swedish, Turkish, Hindi, Bangla, Arabic and more

Please do not hesitate to contact us, even if your country is not listed here. We might be able to support you anyway or connect you to one of our partners.

Countries, where we offer Higg FEM training & verification

M-Z

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Macedonia
Madagascar
Malaysia
Mali
Malta
Mauritani
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Netherlands
New Zealand
Niger
Norway
Pakistan
Poland
Portugal
Qatar
Romania
Rwanda
San Marino
Saudi Arabia
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Serbia
Sierra Leone
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Spain
Sri Lanka
Sudan
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Switzerland
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Thailand
Togo
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United Kingdom
United States
Vietnam
Zimbabwe

Languages: English, German, French, Portuguese/English, Swedish, Turkish, Hindi, Bangla, Arabic and more

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Have you heard?

Recording & Presentation:

Sections 1 & 2:
Site info &
Permits and EMS

Section 3:
Energy & GHG

Section 4:
Water Use

Section 5:
Wastewater

How to Improve Your SAC Higg FEM Score – Updates to the How to Higg

What to Expect On the Day of Your Higg FEM Verification

FEM Training & Verification Offer

Leadership & Sustainability

For training and verification – contact us

You can book a time slot for a call via our booking tool. Simply follow these steps:

1. Go to our booking page
2. Select “General Appointment” from the “Category” menu
3. Go to the “Service” menu and select “Appointment – 30 min”
4. Go to the “Employee” menu and select “Karin Ekberg”
5. Indicate your availability and click next
6. Choose your preferred date & time
7. Provide your contact details and any further notes you’d like to share

In case of difficulties, simply contact us
Global: Karin Ekberg
Turkey: Alaaddin Okur
Bangladesh: Hafizur Rahman

About Leadership & Sustainability

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