

## Speakers



Dr Raphael Bar  
BR Consulting



Sinéad Cowman  
Lonza

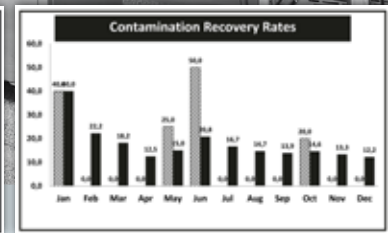
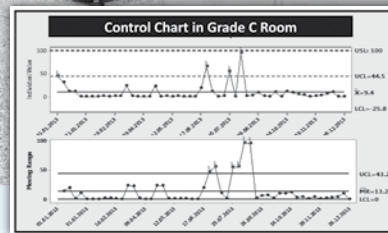


Michael Schiffer  
Novartis Stein

# Environmental Monitoring

## Trending, Analysis and Data Management

18-20 November 2020 | Barcelona, Spain



*A Hands-on Training on efficient Data Management and Interpretation*

## Highlights

- Regulations and Infra Structure
- Tools like MODA and Minitab
- Charting, Trending and approaches for Interpretation
- Data Variability
- Control Charts
- Strategy and Tools for detecting Trends
- Risk assessment in investigation

Practical exercises with software tools

## Objective

This practical course will first present the basic methodology of evaluating the Environmental Monitoring (EM) data using elementary Statistical Process Control (SPC) tools as well as empirical approaches to set microbial control limits for clean rooms. This course will address the following issues:

- Overview of controlled rooms classifications, elements of an EM program and present EU and FDA regulations including the recent ISO 14664 changes
- How to organize and present an abundant amount of microbial data in meaningful graphs
- How to draw useful Control Charts with this data, using the software program Minitab® 19
- To understand how action and alert control limits are set
- How to demonstrate that the environmental microbial monitoring process is under a state of control
- How to calculate and plot the newly proposed Contamination Recovery Rates in USP Chapter <1116>
- How to detect a trend in the environmental microbial monitoring process
- How to apply risk assessment in investigations

All above issues will be demonstrated on examples and case studies of microbial counts generated in controlled rooms of manufacturing facilities of sterile products.

**Please note** that a laptop is needed for the practical exercises. Also, the “Minitab 19” software must be installed on this computer to solve exercises and generate control charts. You can download a free 30 days trial version of this software here: <https://www.minitab.com/en-us/downloads/>

## Background

Regulatory agencies require from manufacturing companies of pharmaceuticals and biopharmaceuticals, particularly of sterile drug products, to maintain an environmental monitoring program, whereby particulates as well as microorganisms in either air samples (active and passive sampling) or in surfaces (contact plates) are routinely tested and monitored.

Thus, a multitude of environmental microbial data is generated on a routine basis and it is recorded in a manner permitting trend evaluation. But collecting EM data is only the first challenge. The following challenge for the responsible person in quality is charting, analyzing data, setting action and alert limits, interpreting the overall monitoring process behaviour, detecting a trend or shift in contamination levels, monitoring excursion rates and contamination recovery rates, while conducting an ongoing risk analysis. According to the recent revision of EU Annex 1 (Dec. 2017), results from monitoring should be considered when reviewing batch documentation for finished product 1638 release. Therefore, this course is aimed at providing empirical tools for charting and trending EM data.

## Target Audience

- Environmental Monitoring personnel in facilities of pharmaceuticals, biopharmaceuticals and medical devices
- Microbiologists, Quality Assurance personnel, Regulatory Affairs personnel, Production Managers, QC Managers, Senior Management

## Programme

### Introduction to Charting and Trending

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- QbD and trending
- Run Chart vs. Shewhart Control Charts
- Control charts of grouped data versus of individual data
- Examples of microbial charts: grouped vs individual counts
- Variables versus attributes charts
- Poisson and Binomial control chart
- Common cause variation vs. Special Cause (Assignable) variation
- State of control

### Regulations on Environmental Monitoring

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- Overview of current regulations
- Draft Annex 1

### Variability of Data

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- Standard deviation of a sample and of population
- Histogram
- Standard deviations of the mean Range
- Relation between standard deviation and Range
- Short-term variation versus global variation
- Separating the signal from noise



### Exercise: Calculation of within-group and global Standard Deviations

### Control Charts of grouped Data

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- Plotting Run chart and control chart (Process Behaviour Chart)
- Computation of three-sigma Control limits
- Control charts of average, range and standard deviation

### Brief Acquaintance with Minitab® 19

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- Basic structure of Minitab software
- Drawing a Control Chart

### Control Charts of individual microbial Counts

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- Moving range (mR)
- Control charts of individual data (XmR)
- Calculation of control limits
- The three-way chart
- Examples of three-way charts

## Exercises: Building with Minitab Control Charts of Microbial Counts from passive and active Air Sampling

### Data Strategies and Environmental Monitoring – MODA System

- Data requirements for the evaluation and selection of an electronic system
- How to maximise the value of your data
- Trend analysis tools and tips
- Setting alert and action limits
- Data integrity issues

### Environmental Monitoring Program to gain strong Data

- Practical aspects of Environmental Monitoring
- How to set up a structured EM program and gain strong data
- Risk based approach
- Handling of big data amounts
- EM program examples from Industrial clean rooms

### Contamination Recovery Rates

- Contamination recovery rates (USP approach <1116>)
- Plotting recovery rates and excursion rates
- Limits of rates versus actual values
- Calculations of contamination recovery rates per USP <1116>

### Distribution-free Approach

- Disadvantages of the distribution-based approach
- Non-parametric percentile as control limit
- Tolerance intervals limits
- Shewhart approach for setting control limits

## Exercises of percentile determination, plotting of Laney's charts, Calculations of Contamination Recovery Rates per USP <1116>

### Trending Tool Applications

- Trending tool examples from industries
- Data collection tools
- Reaction and measures on negative trends
- Responsibilities

### General Approach to Microbial Monitoring

- Overall strategy for microbial monitoring
- Plotting Contamination recovery rates
- Laney's charts

## Exercises: Control Charts of Microbial Counts of active Air Samples in Area Grade B and Contact Plates in Area Grade C; Determining Alert Limits with the Methods of Percentile and Confidence Intervals

### Exercise on Trending Tool Applications

- Case studies of evaluation of EM Data
- Use of supportive data

### Strategy for detecting a trend and for Continuous Improvement

- Phase 1 and Phase 2 in process monitoring
- Statistical Control of a process: Is your EM process predictable?
- Nelson rules
- Trending and continued process verification
- Trending for Annual Product Review document
- Example of detecting a shift in microbial counts

### Moderators

Raphael Bar and Axel Schroeder

## Speakers



### Dr Raphael Bar, BR Consulting, Israel

Dr Bar headed the Analytical R&D Laboratories at Teva Pharmaceuticals and the analytical QC Laboratory at Pharmos. He served in the Scientific Advisory Board of global PDA (USA) and is presently a board member of Israel PDA Chapter as well as a member of the organizing committee of the Israel Society for Analytical Chemistry. For the last ten years, Raphael Bar has been a pharmaceutical consultant for the Pharma and bio-Pharma industries.



### Sinéad Cowman, EU Business Development Manager – Informatics, Lonza

Sinéad studied Microbiology at Trinity College Dublin and has over 15 years experience in QC Microbiology. She joined Lonza in 2005 to manage their endotoxin business in Ireland and for the past 7 years has been involved in their informatics division.



### Michael Schiffer, Process Expert, Novartis Pharma Stein, Switzerland

Michael studied Applied and Molecular Biotechnology at the RWTH Aachen. After his Master Thesis at Novartis, he joined Novartis 2013 as QA Specialist. 2016 he became Senior QA Specialist and Process Expert. Assistant production manager for state-of-the-art fill/finish Sterile Manufacturing of a biotech brand for ww supply. Professional focus on compounding, filling and packaging of Prefilled Syringes. Furthermore responsible for an Autoinjector assembly line. Further activities: Process improvements, launch projects, inspections and audits (incl. FDA, RHI, 3rd Party), deviations & complaints, SOPs.

If the bill-to-address deviates from the specifications on the right, please fill out here:

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## Environmental Monitoring - Trending, Analysis and Data Management 18 - 20 November 2020, Barcelona, Spain

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Company

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P.O. Box 101764

Fax +49 (0) 62 21/84 44 34

### General terms and conditions

- If you cannot attend the conference you have two options:
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  2. If you have to cancel entirely we must charge the following processing fees:
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    - Cancellation until 1 week prior to the conference 50 %
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- Terms of payment: Payable without deductions within 10 days after receipt of invoice.
- Important: This is a binding registration and above fees are due in case of cancellation.

- cancellation or non-appearance. If you cannot take part, you have to inform us in writing. The cancellation fee will then be calculated according to the point of time at which we receive your message.
- In case you do not appear at the event without having informed us, you will have to pay the full registration fee, even if you have not made the payment yet. Only after we have received your payment, you are entitled to participate in the conference (receipt of payment will not be confirmed!) (As of January 2022).
- German law shall apply. Court of jurisdiction is Heidelberg.

- Privacy Policy: By registering for this event, I accept the processing of my Personal Data. Concept Heidelberg will use my data for the processing of this order, for which I hereby declare to agree that my personal data is stored and processed. Concept Heidelberg will only send me information in relation with this order or similar ones. My personal data will not be disclosed to third parties (see also the privacy policy at [http://www.gmp-compliance.org/eca\\_privacy.html](http://www.gmp-compliance.org/eca_privacy.html)). I note that I can ask for the modification, correction or deletion of my data at any time via the contact form on this website.

## Date

Wednesday 18 November 2020, 08.30 – 18.00 h  
(Registration and coffee 08.00 -08.30 h)  
Thursday, 19 November 2020, 08.30 - 17.00 h  
Friday, 20 November 2020, 08.30 – 13.30 h

## Venue

Barcelo Sants Hotel  
Pl. Paisos Catalans, s/n  
08014 Barcelona, Spain  
Pone +34 (0)93 503 53 00  
Email [sants@barcelo.com](mailto:sants@barcelo.com)

## Fees (per delegate, plus VAT)

ECA Members € 1,790  
APIC Members € 1,890  
Non-ECA Members € 1,990  
EU GMP Inspectorates € 995

The conference fee is payable in advance after receipt of invoice and includes conference documentation, dinner on the first day, lunch on the first and second day and all refreshments. VAT is reclaimable.

## Accommodation

CONCEPT HEIDELBERG has reserved a limited number of rooms in the conference hotel. You will receive a room reservation form/POG when you have registered for the course. Reservation should be made directly with the hotel. Early reservation is recommended.

## Registration

Via the attached reservation form, by e-mail or by fax message. Or you register online at [www.gmp-compliance.org](http://www.gmp-compliance.org).

## Conference language

The official conference language will be English.

## Social Event



In the evening of the first course day, you are cordially invited to a social event. This is an excellent opportunity to share your experiences with colleagues from other companies in a relaxed atmosphere.

## Organisation and Contact

ECA has entrusted Concept Heidelberg with the organisation of this event.  
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