

# *Category 2: Industry Excellence in Consulting, Research or Education*

## SPA Foamed Bitumen VOC Process

Scott Young  
Stabilised Pavements of Australia



# *2023 AustStab Awards of Excellence*

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# Overview of Initiative



Working with hot bitumen can have disastrous effects if not well understood or respected. Add in the complexity of a multi million dollar stabilising machine and the importance of an individual to have adequate skills to safely operate one becomes one of the most important VOC's a person can obtain in the field of pavement stabilisation.

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**AustStab**   
Pavement Recycling and Stabilisation Association

# VOC Description

Operators of mobile plant in Australia must possess a verification of competency (VOC) to validate that they have a minimum standard of skill, understanding and safe operating ability to operate a particular piece of plant. For stabilising machines and in particular those required to conduct foamed bitumen operations, there is a national VOC titled, 'RIISS00050 Operator of Stabiliser (using foam bitumen) Skill Set'. Within this program there are 6 units or modules that an operator is required to complete to be deemed 'competent'. They include working safely around bitumen, plant support, communication, operating a stabiliser, use of power tools and general workplace safety.

SPA has developed its own VOC program that not only covers the minimum requirements of the national VOC program under RIISS00050, but goes over and beyond with the intent to provide significantly increased skills around machine operation and working safely around bitumen. SPA's foamed bitumen VOC program consists of four fundamental modules, being:

- 1) Classroom based training.
- 2) Completion of AfPA's online 'Be Bitumen Safe' training module.
- 3) An onsite practical assessment.

A theory assessment.

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# VOC Description

The classroom based training is designed to introduce an already competent stabiliser operator to the world of foamed bitumen. It takes 5-6 hours to complete and currently comprises 110 slides. Some of the content a participant is exposed to includes:

- Theory of Foamed Bitumen
- Safety Aspects
- Operational Procedures
- QA Aspects
- Assessment (theory)
- Assessment Review

Of particular note is the extremely detailed information provided by SPA's internal trainers on the operational procedures to ensure operators have a complete understanding of foamed bitumen operations. Participants are exposed to machine components, prestart flow test, run up and run down procedures, adding foaming agent procedures, mixer/tanker connection and disconnection procedures, mixer operations procedure and a troubleshooting guide.

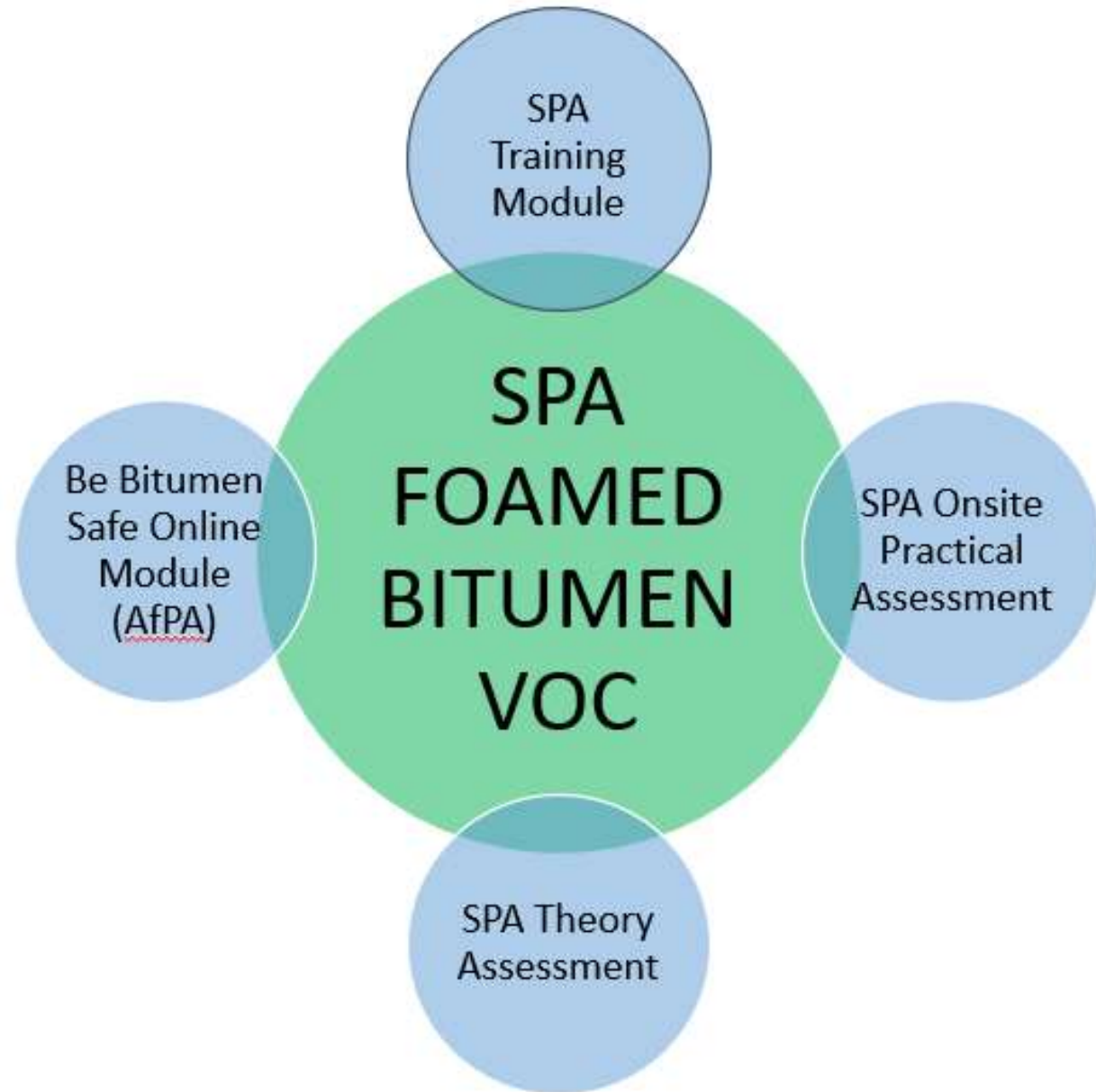
SPA's ambition to build and maintain quality roads safely is empowered by the generation of these VOC programs that provide employees with a greater level of detail than any national program, based off sound industry experience.

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Pavement Recycling and Stabilisation Association

# SPA VOC Process



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# National VOC

The screenshot shows the training.gov.au website interface. At the top left is the logo for training.gov.au, a joint initiative of the Australian and State and Territory Governments. At the top right are links for 'About us' and 'Sign in'. Below the header is a navigation bar with 'Search', 'Reports', 'Resources', and 'More'. There are two filter buttons: 'NRT' and 'RTO/Org'. A search bar contains the text 'Keyword search' and a 'Search' button. The main content area shows a breadcrumb trail: 'Home > Training > RIIS00050'. The title is 'Skill set details' for 'RIIS00050 - Operator of Stabiliser (using foam bitumen) Skill Set (Release 3)'. On the right side, there are three links: 'Export summary to Word', 'Export summary to PDF', and 'Notify me of changes'.

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# National VOC

Units of competency

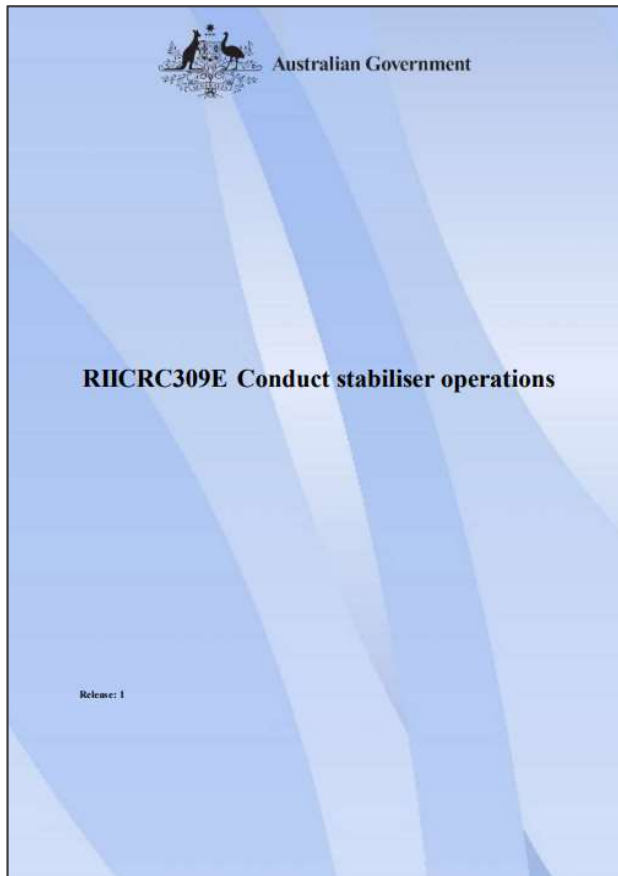
Code	Title	Usage Recommendation	Essential
<a href="#">RIIWHS201E</a>	Work safely and follow WHS policies and procedures	Current	N/A
<a href="#">RIICBS203E</a>	Safely handle bituminous materials	Current	N/A
<a href="#">RIISAM203E</a>	Use hand and power tools	Current	N/A
<a href="#">RIICRC309E</a>	Conduct stabiliser operations	Current	N/A
<a href="#">RIICOM201E</a>	Communicate in the workplace	Current	N/A
<a href="#">RIICCM206E</a>	Support plant operations	Current	N/A

Items per page 10 | 20 | 50 | 100      Displaying items 1 - 6 of 6

The national foamed bitumen VOC has 6 modules. The safety related module is the same as what SPA delivers with the AfPA Be Bitumen Safe training pre-requisite forming part of that module.

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# National VOC



## 3. Operate stabiliser

- 3.1 Identify site hazards associated with stabiliser operations and implement the requirements, controls to minimise risks
- 3.2 Identify and apply operating techniques to specified output and tolerances according to manufacturer specifications and site and job requirements
- 3.3 Monitor and confirm operation of stabiliser against job requirements
- 3.4 Operate stabiliser according to manufacturer specifications and site and job requirements
- 3.5 Monitor movements and hazards and identify and communicate changes to work environment according to site requirements

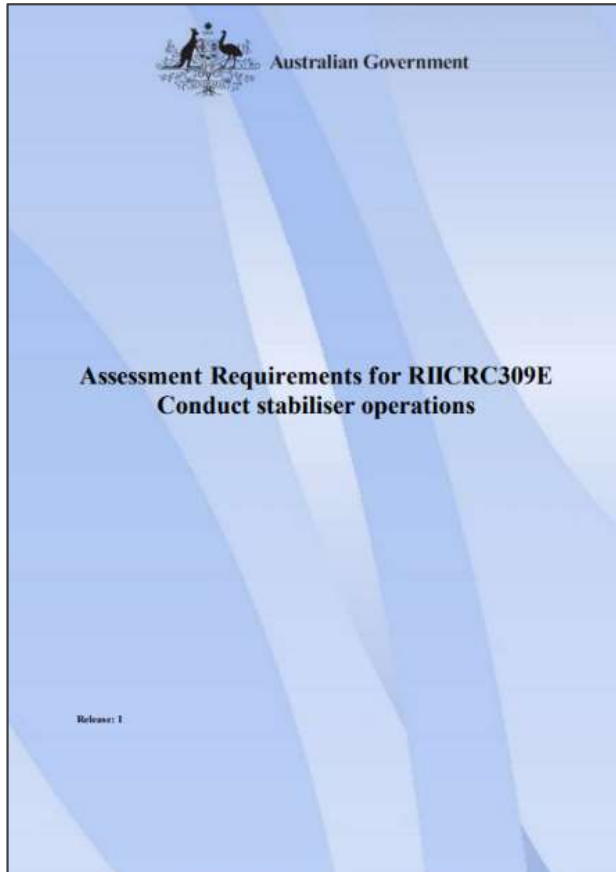
This module is quite generic.

SPA's equivalent requires a foamed bitumen operator to have already been deemed competent in operation of stabilisers performing non-foamed bitumen works.

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# National VOC



## Performance Evidence

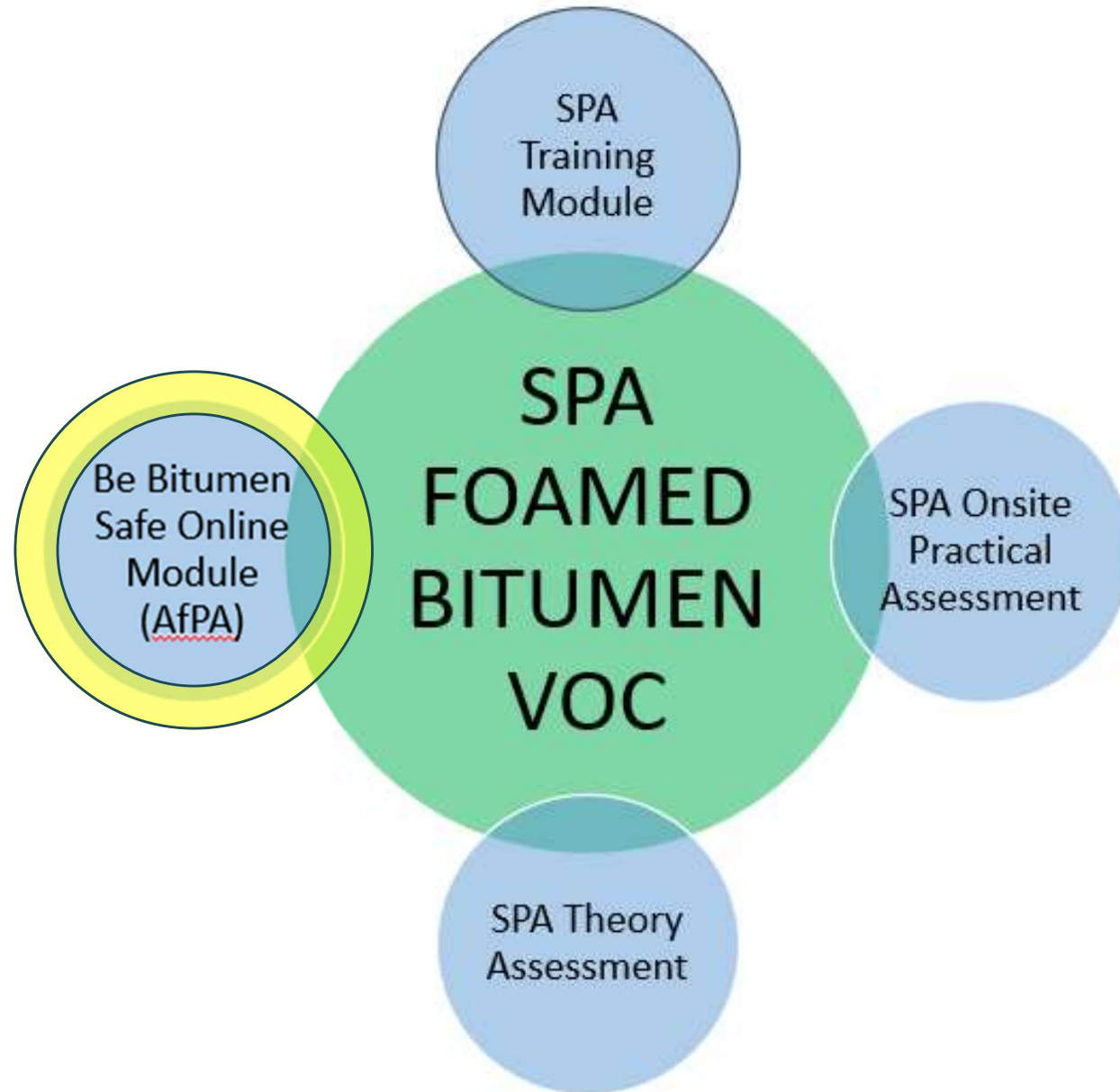
The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- conduct stabiliser operations on at least two occasions on at least two separate projects, including:
  - stabilising using two different additive types for at least 500 square metres, including carrying out the following according to job requirements:
    - checking and confirming moisture content, additive application rate, pulverising, mixing, line and length
    - excavating and remixing existing fill
    - refilling in layers using the stabilised material
    - mixing materials
    - applying additives
    - achieving specified line and depth
    - enhancing the properties of existing pavement
    - decreasing permeability
    - changing volume
  - conducting stabiliser pre-operational checks and rectifying or reporting any faults
  - operating stabiliser according to manufacturer specifications and site and job requirements
  - relocating stabiliser according to manufacturer specifications and site and job requirements
  - carrying out plant maintenance and keeping records
  - clearing work area and disposing of, recycling or storing materials
  - cleaning, checking, maintaining and storing plant, tools and equipment
  - writing records of paver machine performance.

The performance evidence requirements in the national VOC are relatively detailed, however they do not unpack the 'nitty gritty' detail of the componentry of a foamed bitumen stabiliser, they do not cover the important aspects of bitumen system run-up and run-down processes and many other important aspects required to be deemed competent.



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# SPA VOC Process




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# Working with Hot Bitumen

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Be Bitumen Safe



Industry Card – Be Bitumen Safe Online Training

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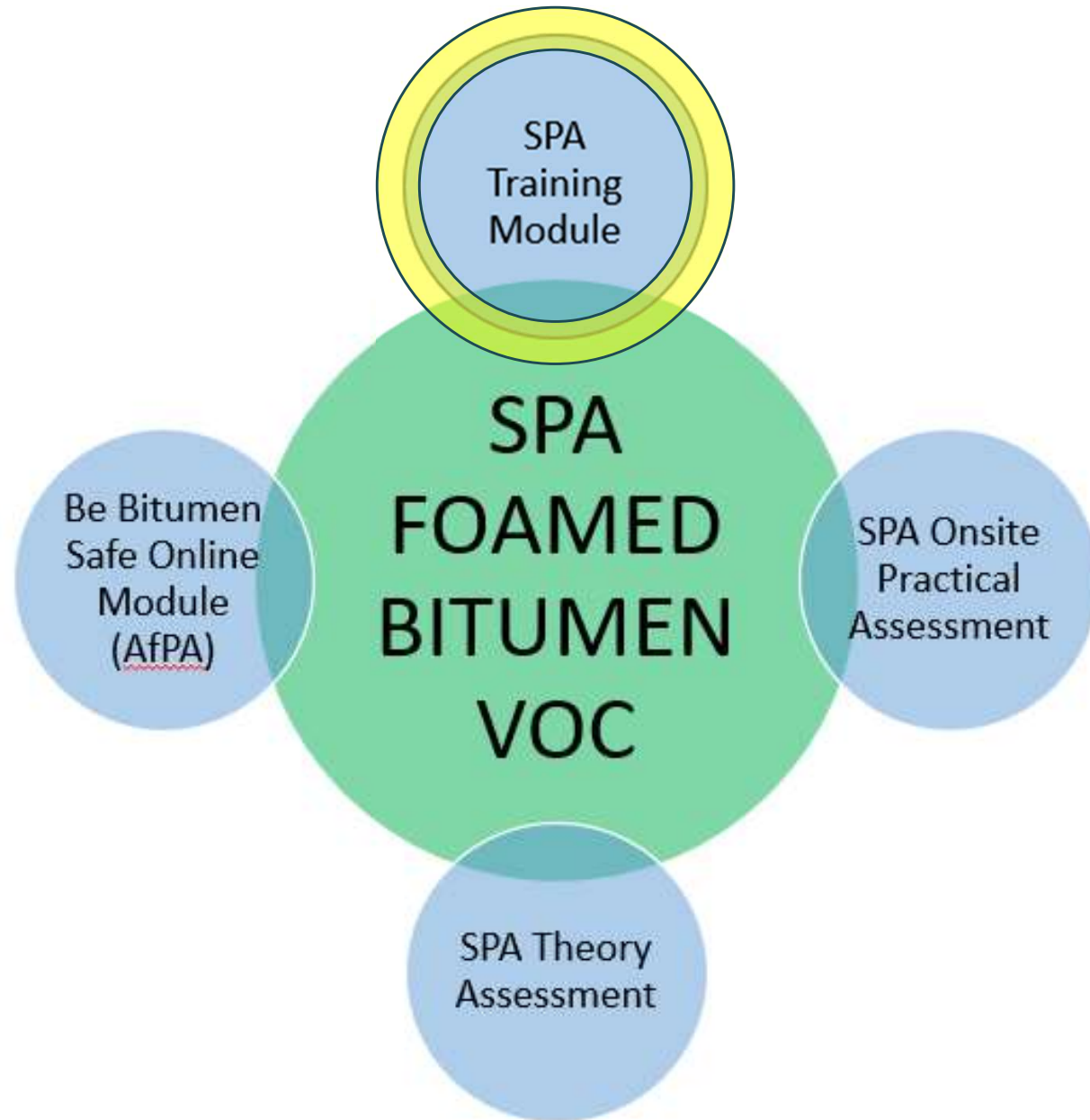
# Working with Hot Bitumen



SPA invests heavily in the 'Be Bitumen Safe' online training module. This is a mandatory requirement for any operator wishing to be deemed competent in foamed bitumen operations.

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# SPA VOC Process



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# SPA's Theory Training



**SPA FOAMED BITUMEN TRAINING MODULE**

**Training Topics**

- ✓ Theory of Foamed Bitumen
- ✓ Safety Aspects
- ✓ Operational Procedures
- ✓ QA Aspects

**STABILISED PAVEMENTS OF AUSTRALIA**  
STRENGTH • FLEXIBILITY

**Friday 27<sup>th</sup> July 2018**

**Victoria Office**

**10am – 3pm**

**Incorporating classroom based Training & Theory Assessment**

**Who Should Attend?**

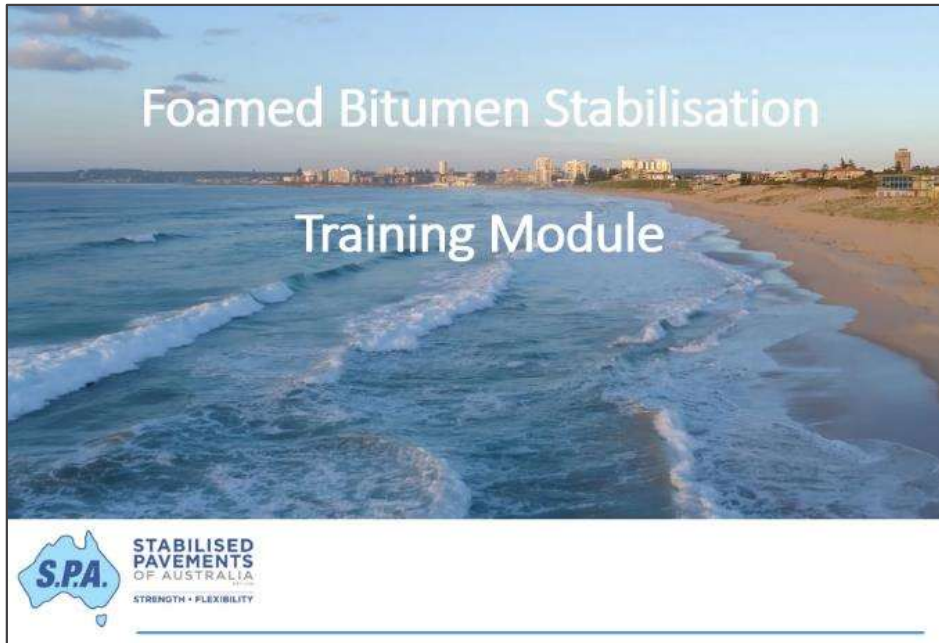
- Supervisors
- Foremen
- FB Operators seeking a FB VOC

For further information, contact your local Manager

SPA's foamed bitumen training module is the classroom style module that exposes operators to a variety of elements relating to foamed bitumen. Due to the time required to undertake this module, careful planning is often required to set up these sessions, usually with small groups of employees.

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# SPA's Theory Training



## AGENDA

Session 1.	Theory of Foamed Bitumen	1.0hrs
Session 2.	Safety Aspects	1.0hrs
	BREAK	
Session 3.	Operational Procedures	1.5hrs
	BREAK	
Session 4.	QA Aspects	0.5hrs
Session 5.	Assessment (theory)	1.0hrs
	Assessment Review	0.5hrs

**S.P.A.** STABILISED PAVEMENTS OF AUSTRALIA  
STRENGTH • FLEXIBILITY

As you can see, SPA's foamed bitumen training module is delivered over a 5-6 hour window. It is usually delivered by 1 or 2 internal trainers/managers.

The 'theory' element of this module is similar to the foamed bitumen content contained within the CPEE/AustStab Stabilisation Fundamentals training package.

The 'Safety Aspects' covers the same requirements set out in the national VOC process.

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# SPA's Theory Training



1	• OVERVIEW OF MACHINE COMPONENTS
2	• OFFSITE
2a	• Prestart Flow Test
3	• ONSITE
3a	• Bitumen Run Up Procedure
3b	• Adding Foaming Agent Procedure
3c	• Mixer / Tanker Connection Procedure
3d	• Mixer Operations Procedure & Troubleshooting Guide
3e	• Mixer / Tanker Disconnection Procedure
3f	• Daily Shut Down Procedure

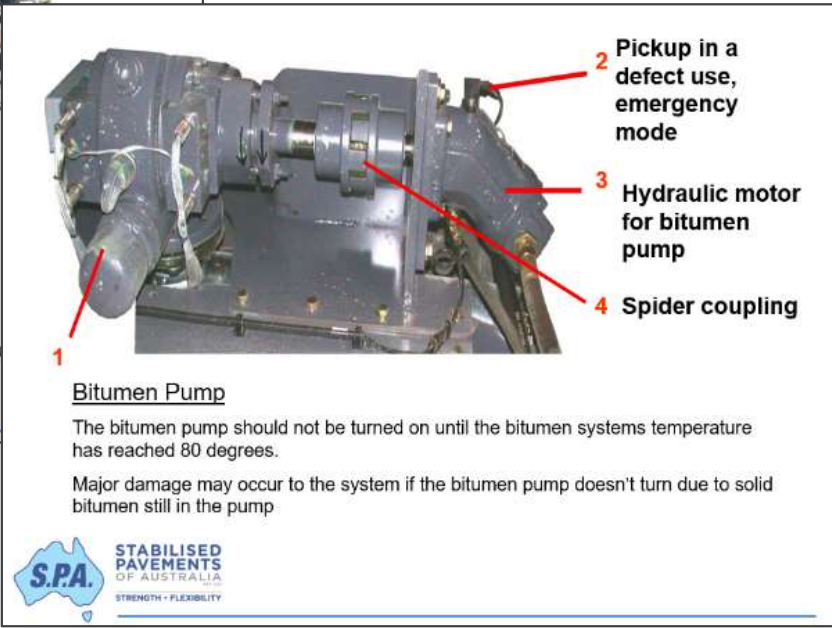
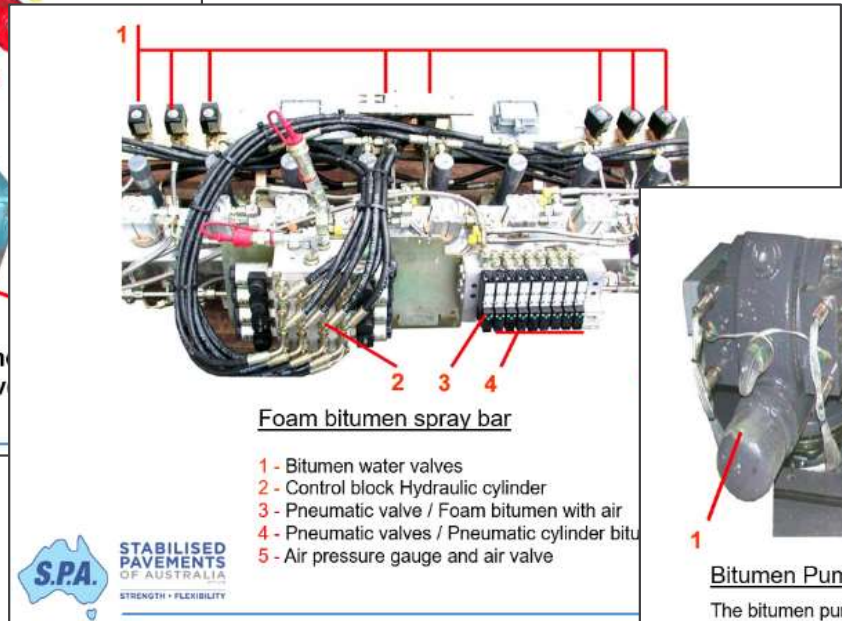
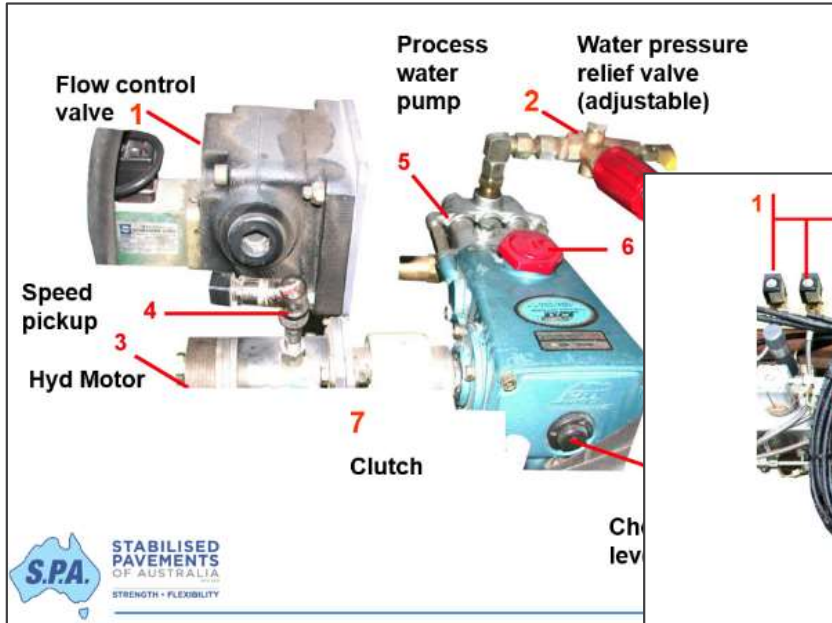
The SPA logo is located at the bottom left of the table of contents, featuring a map of Australia and the text "STABILISED PAVEMENTS OF AUSTRALIA" and "STRENGTH • FLEXIBILITY".

The 'Operational Procedures' element of this module is the most detailed and is where the most differentiation between SPA's VOC process and the national process occurs.

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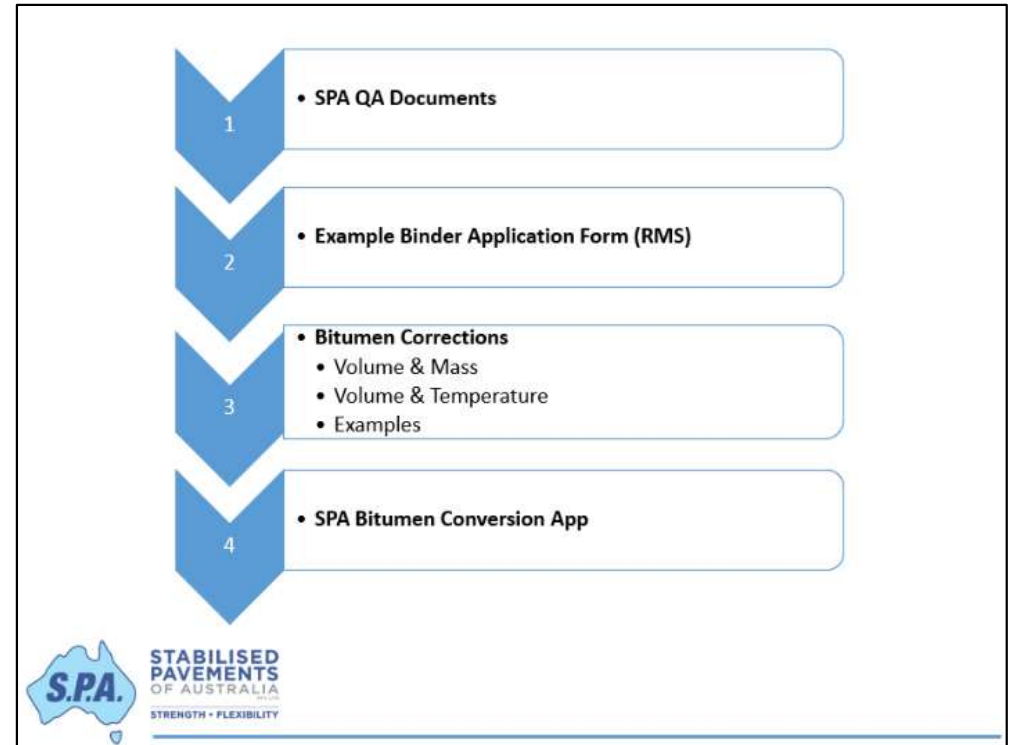


# SPA's Theory Training



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# SPA's Theory Training

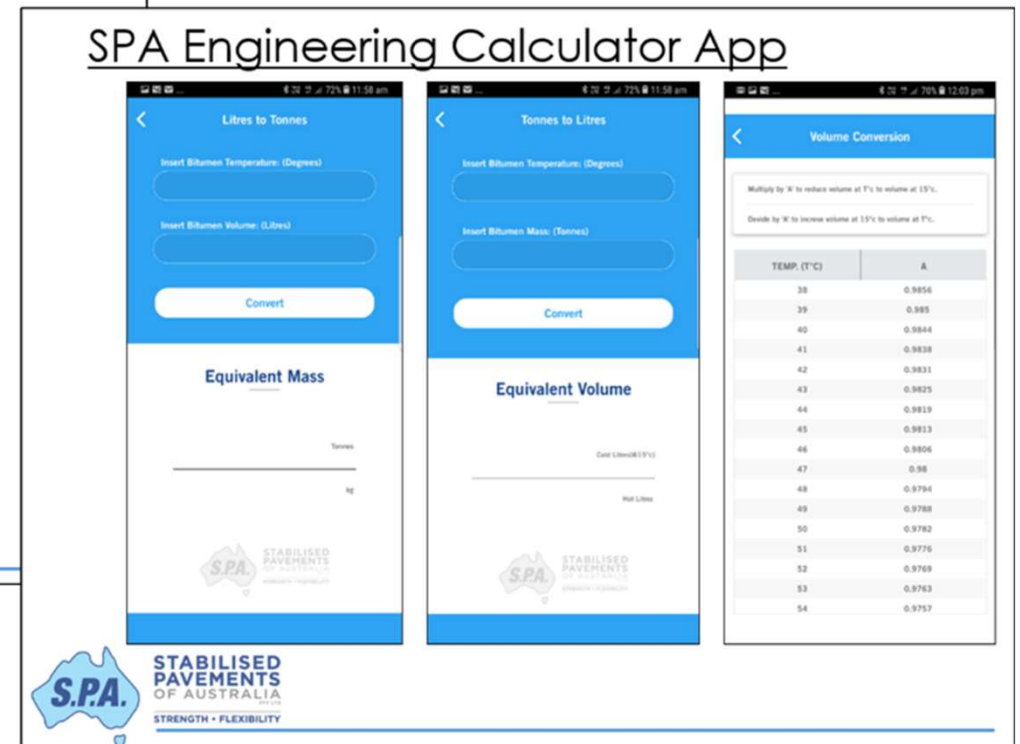
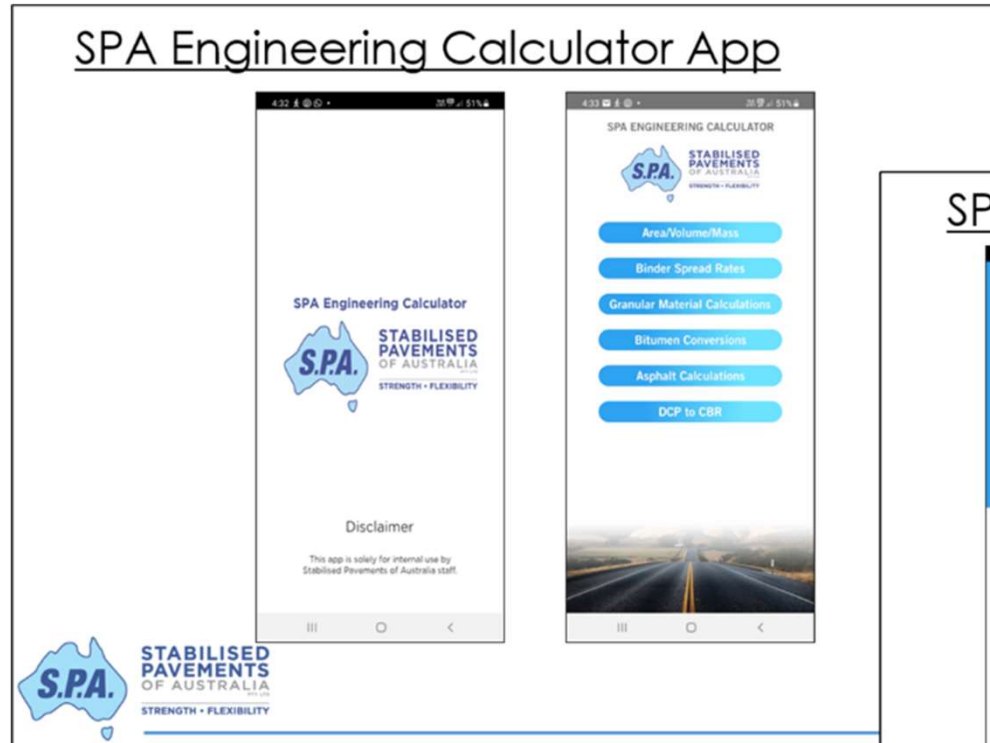


The 'QA Aspects' is equally important to ensure competent operators can actually deliver specification compliant work in the field.

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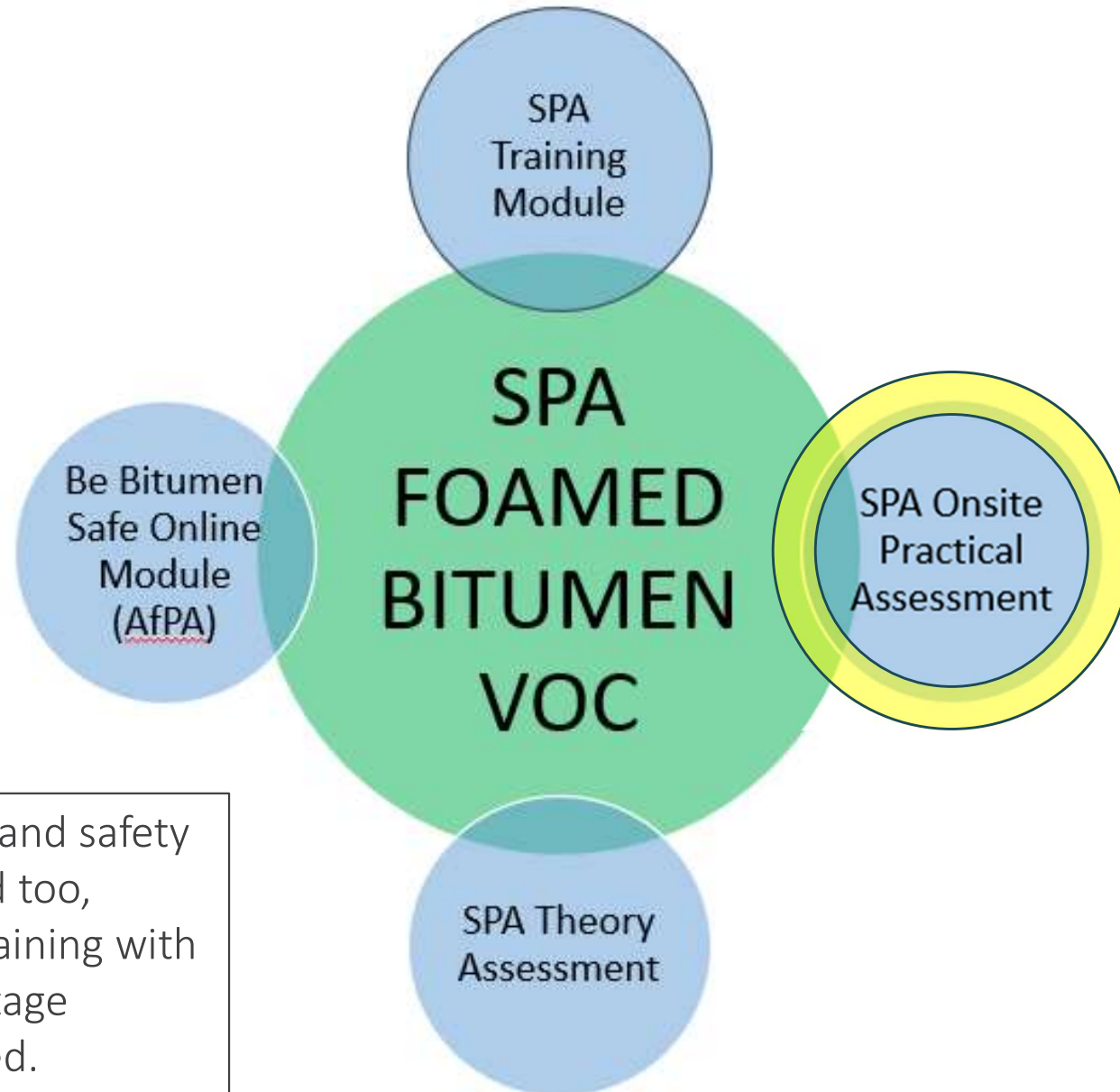
# SPA's Theory Training



Some SPA operators prefer to use SPA's Engineering Calculator App that provides user friendly support to change from litres to tonnes or vice versa at any temperature.

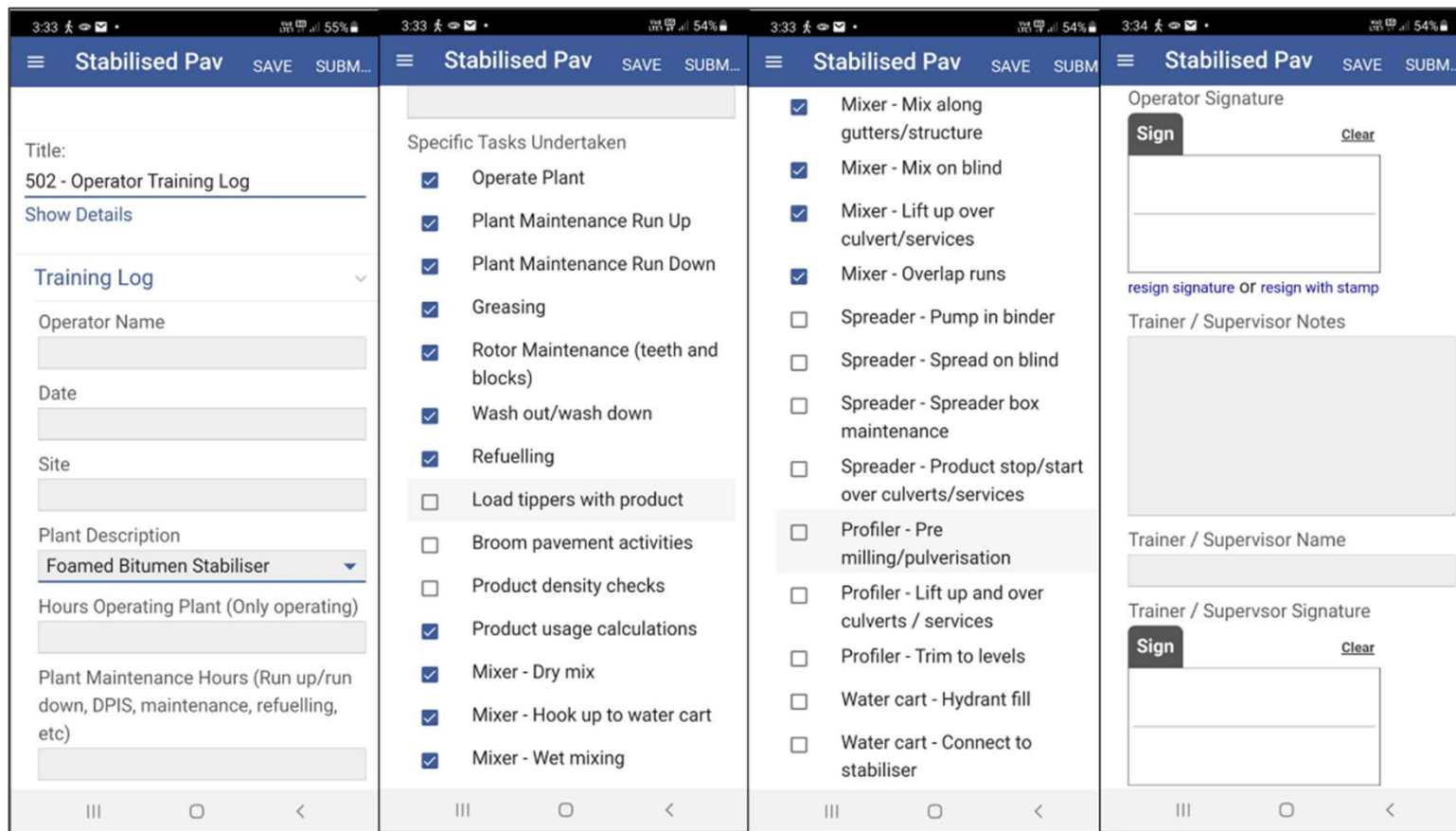
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# SPA VOC Process



Once the classroom training and safety modules have been attended too, operators begin their field training with the objective of reaching a stage whereby they can be assessed.

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When an operator begins learning operation of the foamed bitumen stabiliser in the field, they are required to log their hours electronically. A minimum of 40 hours is required before a gate is opened to inform a trainer that the operator is potentially ready to undergo an assessment. A trainer will only proceed to the assessment phase when there is clear evidence that the operator has been logging hours in each of the 'ticked' boxes shown and therefore has been exposed to a wide variety of field operational situations.

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# SPA's Practical Training



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# SPA's Practical Training



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# SPA's Practical Training

**Training session notes**


**Is there any safety concerns during the session** Safe

Declin and I covered the importance of a correct run up and run down with foam bitumen operations this included bitumen water filter clean bitumen jets not obstructed with materials a clean clear flow of all bitumen water jets and visually seeing this with both side doors off the bowl area once this is done

Any bitumen mess Cleaning g up and dispose of correctly


---

**Trainer**

 kori.joseph  
01.06.2023 09:33 AEST

---

**Candidate**

 declan.payne  
01.06.2023 09:33 AEST

Declin and I covered the importance of a correct run up and run down with foam bitumen operations this included bitumen water filter clean bitumen jets not obstructed with materials a clean clear flow of all bitumen water jets and visually seeing this with both side doors off the bowl area once this is done

Training notes are recorded by SPA's internal trainers to provide evidence of field based learning activities.


# SPA's Practical Training

**Training session notes** 100%

**Is there any safety concerns during the session** Safe

Chevy and I covered at the prestart the importance of bitumen exclusion zones bitumen burns and bitumen burns cards on site with correct course of actions if someone got burnt and the closest hospital if this happens and mentioned you must not be anywhere near the exclusion zone of 15

Trainer

 kori.joseph  
02.03.2023 10:09 AEDT

Chevy and I covered at the prestart the importance of bitumen exclusion zones bitumen burns and bitumen burns cards on site with correct course of actions if someone got burnt and the closest hospital if this happens and mentioned you must not be anywhere near the exclusion zone of 15 mtrs without correct ppe we also we t through foam bitumen calcs and formulas ,bucket test expansion ratio and half life , consistency, trouble shooting, run up run down , what too look for when foam materials is not foaming properly causing streaks and puggy materials within the mix

Training notes are recorded by SPA's internal trainers to provide evidence of field based learning activities.

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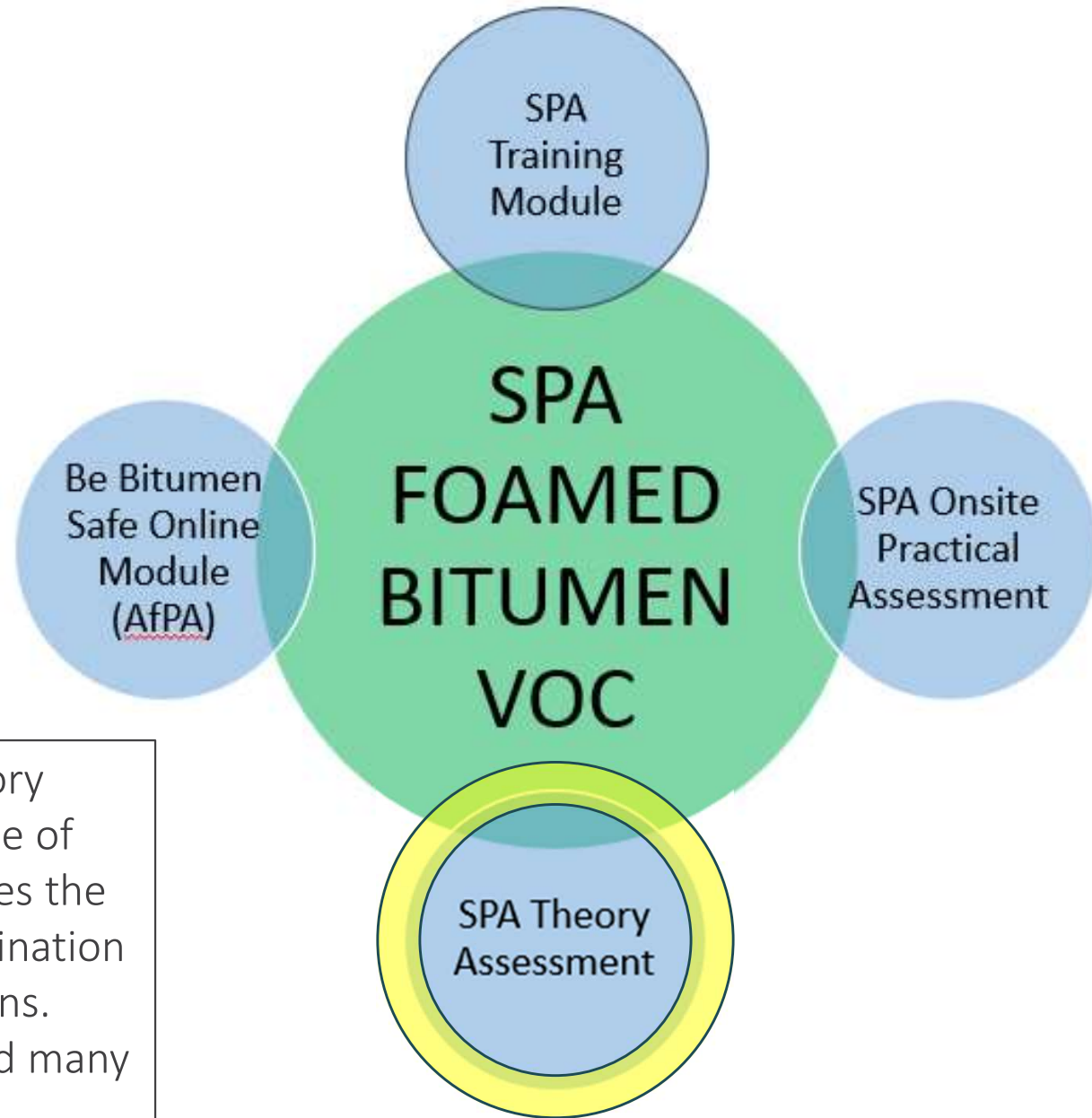
# SPA's Practical Assessment



Practical assessments are only carried out by SPA internal trainers who have the appropriate train and assess qualifications, have a foamed bitumen VOC themselves and have had at least 5 years experience.

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# SPA VOC Process



The final module is the 'Theory Assessment' this is where one of SPA's internal trainers provides the operator with a theory examination consisting of over 30 questions. Some are multiple choice and many require free text responses.

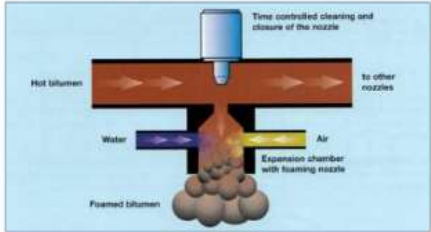
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# SPA's Theory Assessment


**STABILISED PAVEMENTS OF AUSTRALIA**  
 STRENGTH - FLEXIBILITY

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## Foamed Bitumen Theory Assessment




Name: .....

Date: .....

Location: .....

1


**STABILISED PAVEMENTS OF AUSTRALIA**  
 STRENGTH - FLEXIBILITY

---

16. Why should the diesel run down tap be closed after rundown?
  
17. When cleaning the bitumen filter how is this to be done and why should the ball valve on the front of bitumen pump be opened?
  
18. Why should the air valve on top of the bowl be open?
  
19. When should a dip be done on the bitumen tanker? Is the reading in litres or kg?
  
20. Why do you prime the bitumen system before operating?
  
21. With steep gradients, is it best to mix up or down hill?
  
22. What is the optimum temperature for foaming?
  
23. What are the risks of using bitumen that is greater than 195 degrees?

6

Calculate the bitumen volume (litres) for the above if the temperature is 175 degrees celcius. C170 Bitumen Tonnes to Litres x 971 at 15 degrees celcius.  
 The conversion factor for 175 degrees celcius is 0.9031.

25m 900kg  
 50m 1800kg  
 75m 2700kg  
 100m 3600kg  
 125m 4500kg  
 150m 5400kg  
 175m 6300kg  
 200m 7200kg

968,1936,2904,3872,4840,5808,6776,7744

**What is the maximum speed when conducting foamed bitumen operations?**

10m per minute

**For best results, what should the bitumen pressure gauge read when operating?**

No more than 10bar

**On the operators display, should the pump selection switch be set on I, II or III**

11

**On the display, what does 1/1 an 1/2 mean?**

Full bar, half bar for water jets

**Why should you conduct a bitumen test spray before operations begin?**

To make sure the lines are primed and clear of kero or slugs

**Why should you bleed the bitumen water system before operations begin?**

To clear air locks


**Why should the air valve on top of the mixing bowl be open?**

To ensure air is going into for the foaming process

**Foamed bitumen operations should not proceed when the air temperature measure in the shade is above what?**

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# SPA's Theory Assessment



**C2DM6 - Stabiliser Level 6 Foamed Bitumen Practical Assessment**

Matthew Polglase-Wills / C2DM6 practical Complete

Score	100%	Flagged items	0	Actions	0
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Document No. 000001

Employee Name/VOC Number and Description Matthew Polglase-Wills / C2DM6 practical

Client RDH



Conducted on 20.04.2023 18:28 AEST

Prepared by Steve Whan

Location 6 Gilliam Rd  
Geraldton WA 6530  
Australia  
(-28.77852472460273,  
114.59735550828688)


Employee present at pre start meeting Yes

Identify site hazards associated with stabiliser operations and implement the requirements, controls to minimise risks?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Uses a range of communication techniques and equipment essential to the safe completion of work activity, including hand, audible and other signals?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Has the operator checked that the bitumen tanker has bought the correct type of bitumen and weight? (Docket checked)	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Have 25m intervals been marked out to follow for the bitumen usage?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Has the operator filled out the Bitumen Daily Running Sheet and also loaded with foreman for double checking figures?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
<small>Both Rob Eastaughffe and Matt had a very good rapport with each other double checking after each run. Very pleasing</small>	
Did the operator wait until the heaters reached 80 degrees celcius before turning the bitumen pump on?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Operator waited for the bitumen to flow to the machine under gravity pressure up to the bitumen pump before turning it on?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Test squirt was conducted several meters inside the start line and checked for foaming?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Checking and confirming moisture content, additive application rate, stabilisation area and stabilisation depth?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Successfully conducted stabilisation line on blind side?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Identify and apply operating techniques to specified output and tolerances according to manufacturer specifications, site and job requirements?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Monitor and confirm operation of stabiliser against job requirements?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Identify faults or defects and rectify or report within scope of own responsibility and according to workplace procedures?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Can operate close without causing damage to any assets located within or around sites?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Perform work activities within the operating capabilities of the equipment?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Was a consistent speed achieved without exceeding 10 meters per minute?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>

Manage and/or report hazards to maintain a safe working environment	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
Complete and file or distribute documentation in a manner that complies with workplace practices?	<span style="background-color: #76b82a; color: white; padding: 2px;">Yes</span>
<b>Assessment Result</b>	<span style="background-color: #76b82a; color: white; padding: 2px;">Competent</span>
<b>Operator</b>	
	04.05.2023 17:32 AEST
<b>Assessor</b>	
	Steve Whan 04.05.2023 18:38 AEST
20.04.2023 18:38 AEST	
Assessment carried out with the assistance of Rob Eastaughffe	

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# SPA's Theory Assessment



## SPA VOC Sign Off Form

Matthew Polglase-Wills Complete

Score	100%	Flagged items	0	Actions	0
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**Candidates Name** Matthew Polglase-Wills

**Company's name** S.P.A

**Conducted on** 20.04.2023 18:27 AEST

**Prepared by** Steve Whan

**Location** 381 Marine Tce  
Geraldton WA 6530  
Australia  
(+28.77866426126804,  
114.59824653286182)

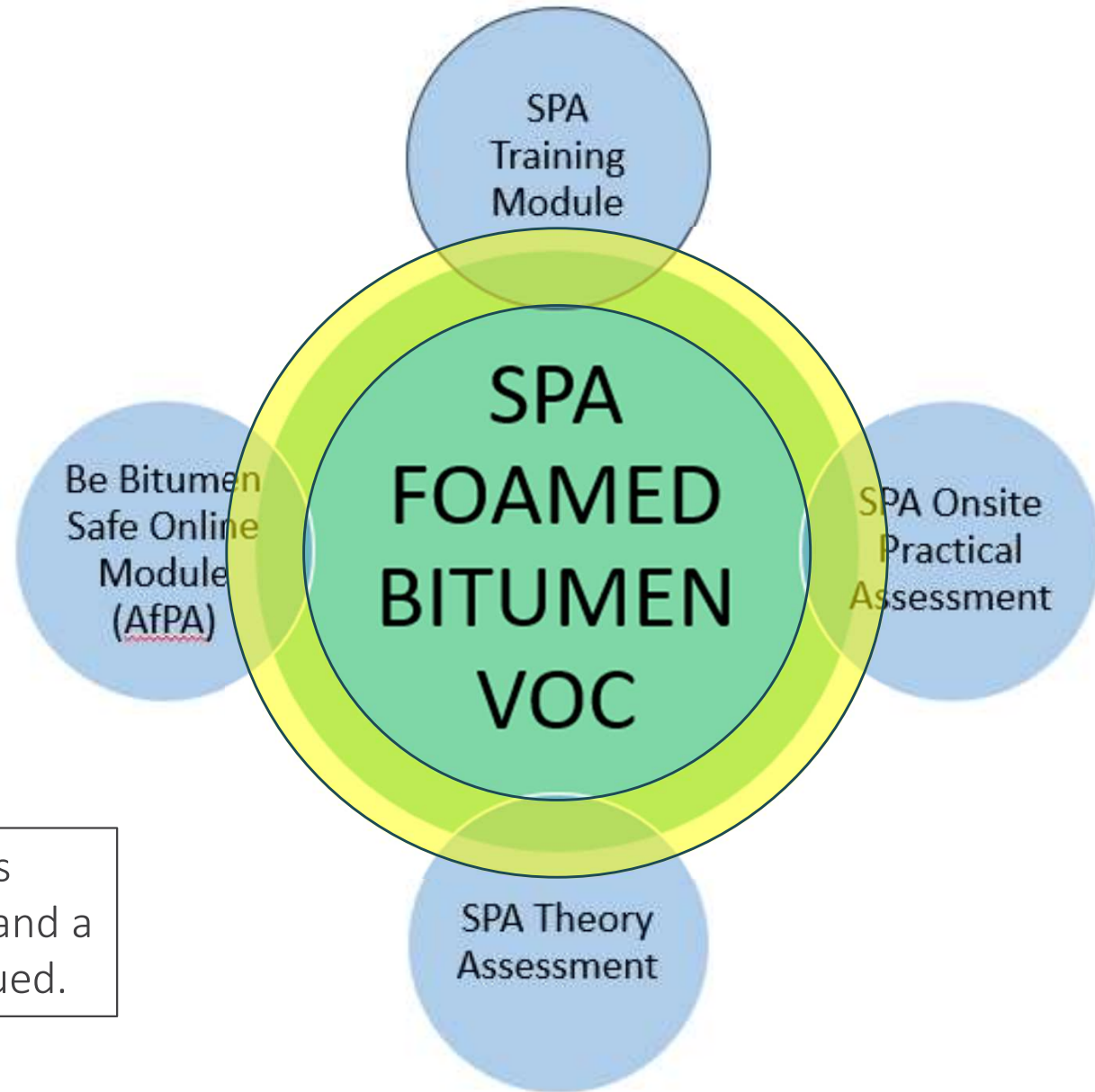
Training session notes	100%
Theory assessment	Competent
Practical assessment	Competent
Operators training log	Satisfactory
Assessment results	Competent
Picture	
Comments	
<b>Trainer</b>	
	Steve Whan 04.05.2023 16:45 AEST
<b>Operator</b>	
	Matthew Polglase-Wills 04.05.2023 16:46 AEST

When the trainer is satisfied that the operator has successfully completed all modules of SPA's foamed bitumen VOC process, a joint sign off form is compiled to evidence this milestone.

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# SPA VOC Process



Then the employee is deemed competent and a VOC certificate is issued.

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# CERTIFICATE OF COMPLETION



**STABILISED  
PAVEMENTS  
OF AUSTRALIA**  
PTY LTD  
STRENGTH • FLEXIBILITY

This is to certify that  
**Matthew Polglase-Wills**

has been verified as competent in  
**C2DM6 - Stabiliser Level 6 Foamed Bitumen**

**Date of Completion: 20/04/2023**

Certificate valid for 3 years from date of completion

**SCOTT YOUNG**  
Training Manager



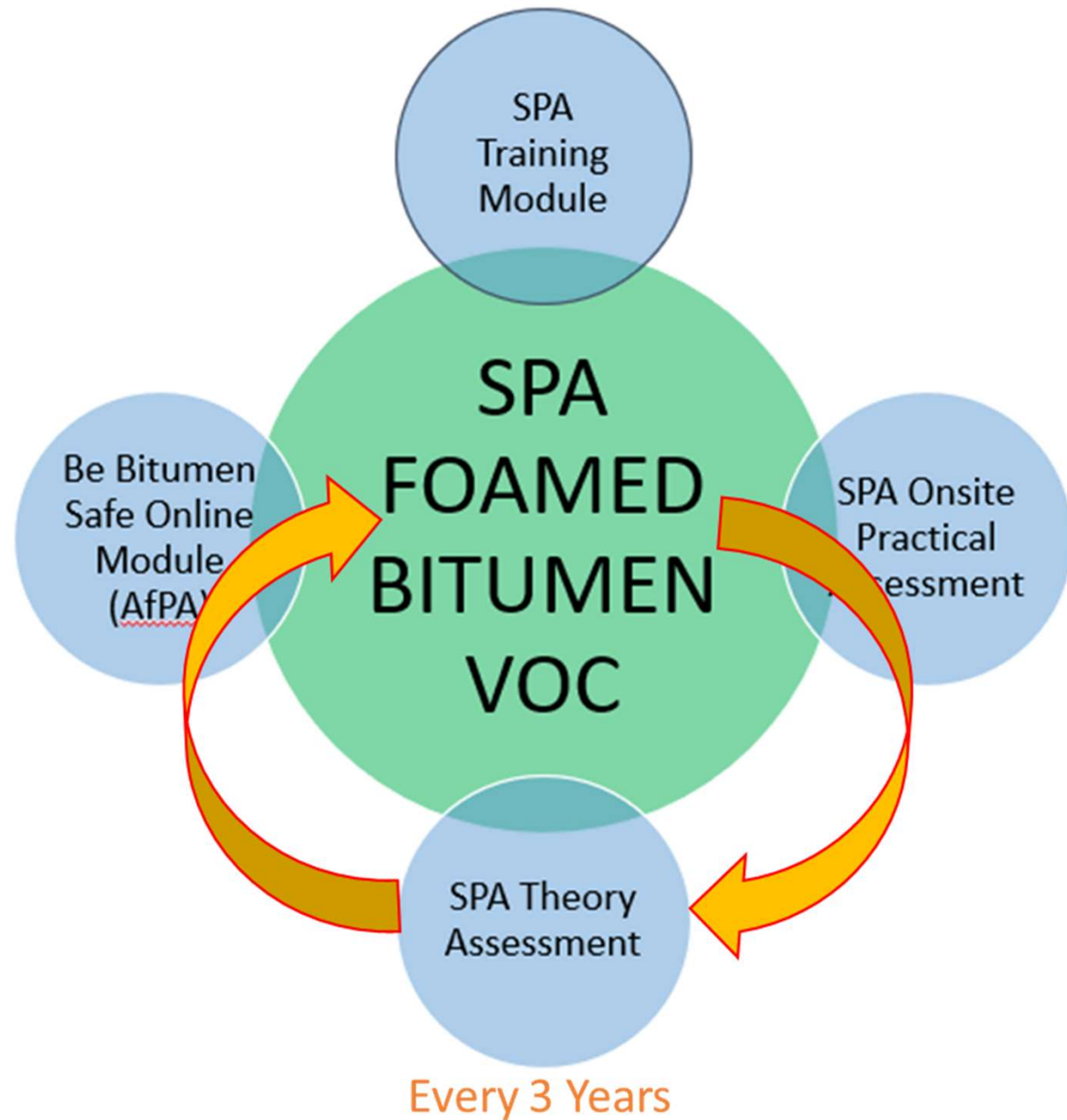
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*Pavement Recycling and Stabilisation Association*

# SPA VOC Process

Once an employee has been deemed competent, their VOC expires after 3 years, at which time they have to be reassessed to ensure they maintain the theoretical aspects and have continued to 'clock up' time operating the foamed bitumen equipment.



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