VIBRATION RESEARCH

THE INNOVATOR IN

SOUND & VIBRATION TECHNOLOGY

WELCOME

VIBRATION RESEARCH

GENERATE A RANDOM TEST USING FIELD DATA

THE INNOVATOR IN
SOUND & VIBRATION
TECHNOLOGY

VIBRATION RESEARCH

CORE VALUES

COLLABORATION

CAPABLE & COMPETENT

ACCOUNTABLE & RESPONSIBLE

STRONG & DRIVEN WORK ETHIC

DO THE RIGHT THING

INNOVATION

VIBRATION RESEARCH

THE INNOVATOR IN
SOUND & VIBRATION TECHNOLOGY

We Develop. You Advance.

Field Data Replication enables test engineers to reproduce data in their lab from actual acceleration waveforms measured in the field.

Kurtosis Control Method effectively brings real world peak acceleration back into random vibration tests, making the tests more representative than traditional gaussian methods of the real world.

Fatigue Damage Spectrum gives engineers a reliable way to use real world data to create an accelerated life test that represents a lifetime of fatigue damage on a product.

Instant Degrees of Freedom provides the smoothest control lines in the industry. This helps with quick ramp up periods, tight tolerances, and easy detection of resonances.

INTRODUCTION

TEST MODES USED FOR GENERATING A TEST BASED ON REAL-WORLD DATA

- Field Data Replication
- Random Import
- Fatigue Damage Spectrum
- UDT/SRS
- Sine Tracking, Acceleration & Generation (STAG)

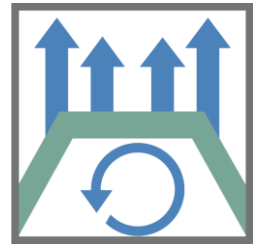
Field Data Replication

Random Import

Fatigue Damage Spectrum

Shock Response Spectra

User Defined Transient



Sine Tracking, Analysis & Generation

INTRODUCTION

THE FATIGUE DAMAGE SPECTRUM

- What is Fatigue Damage?
- How is the FDS calculated?
- How is a Random Test created?

Combine
Compare
Quantify

FDS
FATIGUE DAMAGE SPECTRUM

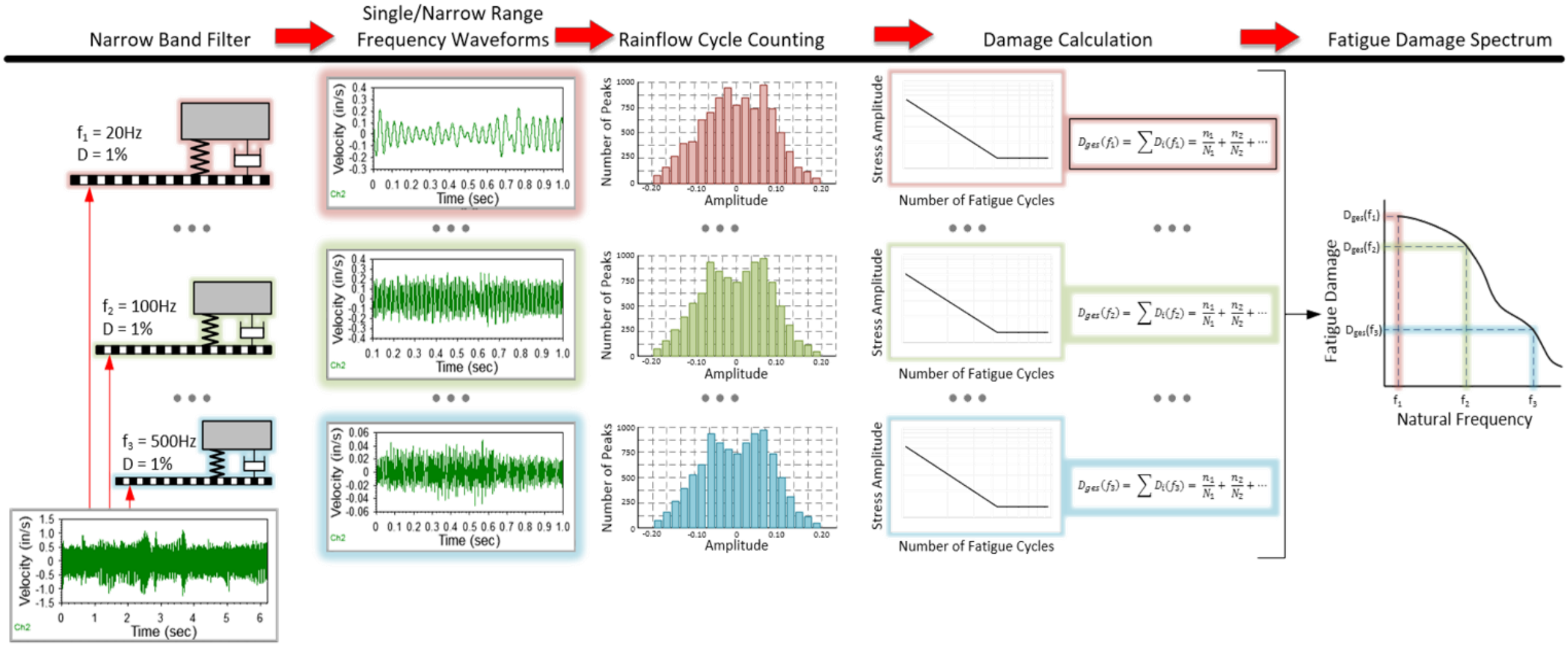
WHAT IS FATIGUE DAMAGE?

DAMAGE THAT IS ACCUMULATED OVER A LARGE NUMBER OF CYCLES RESULTING IN THE FAILURE OF A PRODUCT DUE TO CRACKING, DEFORMATION, BENDING, ETC.

- A typical example is a cantilever beam being exposed to resonance until failure
- The accumulation of damage to the product over time due to repeated stress loads
- It IS NOT exceeding the instantaneous stress limit of the product

Stress Level (G_{RMS})	Time to Failure (min)
5.2766	2.72
4.8997	3.67
4.5228	4.20
4.1459	4.69
3.3921	11.22
3.20365	14.73
3.0152	23.00
2.82675	31.90
2.6383	42.10

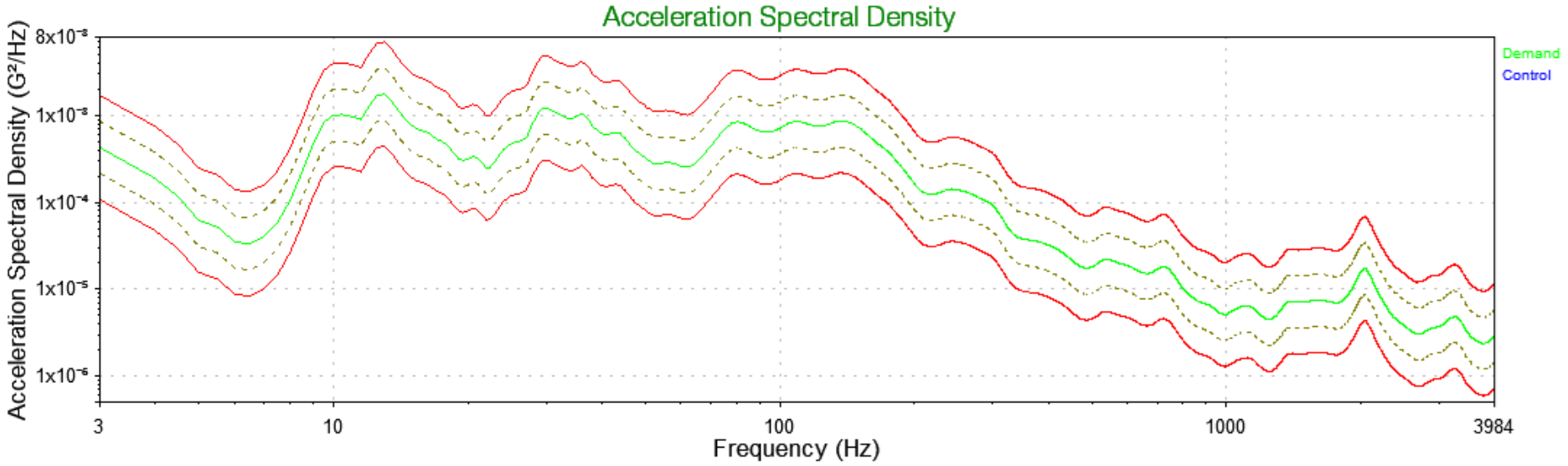
HOW IS THE FDS CALCULATED



HOW IS A RANDOM TEST CREATED?

THE HENDERSON-PIERSOL CONVERSION IS UTILIZED TO CONVERT THE FDS INTO A PSD

- The PSD will generate the same amount of damage to the product as the original waveform(s)
- Nuance: The Henderson-Piersol conversion assumes that the data is Gaussian.



VIBRATION RESEARCH

VIBRATIONVIEW DEMONSTRATION

THE INNOVATOR IN
SOUND & VIBRATION TECHNOLOGY

VIBRATION RESEARCH

UPCOMING WEBINARS

Generate Shock Tests from Field Data
4/28/2020 at 11AM EST

Generate SoR Tests from Field Data
4/30/2020 at 11AM EST

ANY QUESTIONS?

+1.616.669.3028

vrsales@VibrationResearch.com

1294 Chicago Dr | Jenison, MI 49428 USA

VibrationResearch.com