

## **Appendix III: Plots of Generated Time Histories of Ground Motions Conforming to the Three Spectral Shapes**

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## **Appendix III: Plots of Generated Time Histories of Ground Motions Conforming to the Three Spectral Shapes**

This appendix presents plots of the generated time histories of earthquake records for ground motions to be input in the coupled response models of dry cask systems. A total of 180 plots are included as an attachment to this appendix to document the three sets of motions generated with target shaking matched to the three spectral shape procedures, including the NUREG/CR-0098, the Regulatory Guide 1.60 and the NUREG/CR-6728 (central and eastern United States) spectra procedures. Each of the spectrum motion sets has been documented by sixty figures. Figures 1 through 60 provide plots for the NUREG/CR-0098 spectral shape motions. Figures 61 through 120 provide plots for the Regulatory Guide 1.60 spectral shape motions. Figures 121 through 180 provide plots for the NUREG/CR-6728 (central and eastern United States) spectral shape motions. In each figure, time histories of acceleration, velocity and displacement are shown on the upper part of the plot. The lower part of the plot presents its corresponding 5-percent damped pseudo acceleration response spectrum along with cross comparison to its target ground surface reference response spectrum.

For each of the three spectral shapes, fifteen figures are included for each component motion developed for each spectral shape for the original ground surface reference motions which would be spectrum-compatible to each of the three target spectrum. In each of these fifteen figures documenting the benchmark ground surface time histories, acceleration spectra at 5, 10 and 15% damping are also plotted and can be compared to the respective 5% damped smooth spectral shape. The additional forty-five figures were included for each component of deconvoluted motion for the three profiles: (i) stiff soil, (ii) soft soil and (iii) upper bound rock conditions. In each figure presenting the deconvoluted 'within' motions, the 'within' motion has been overlaid on top of the corresponding ground-surface reference spectrum-compatible motions for cross comparison to the 'within' motions.

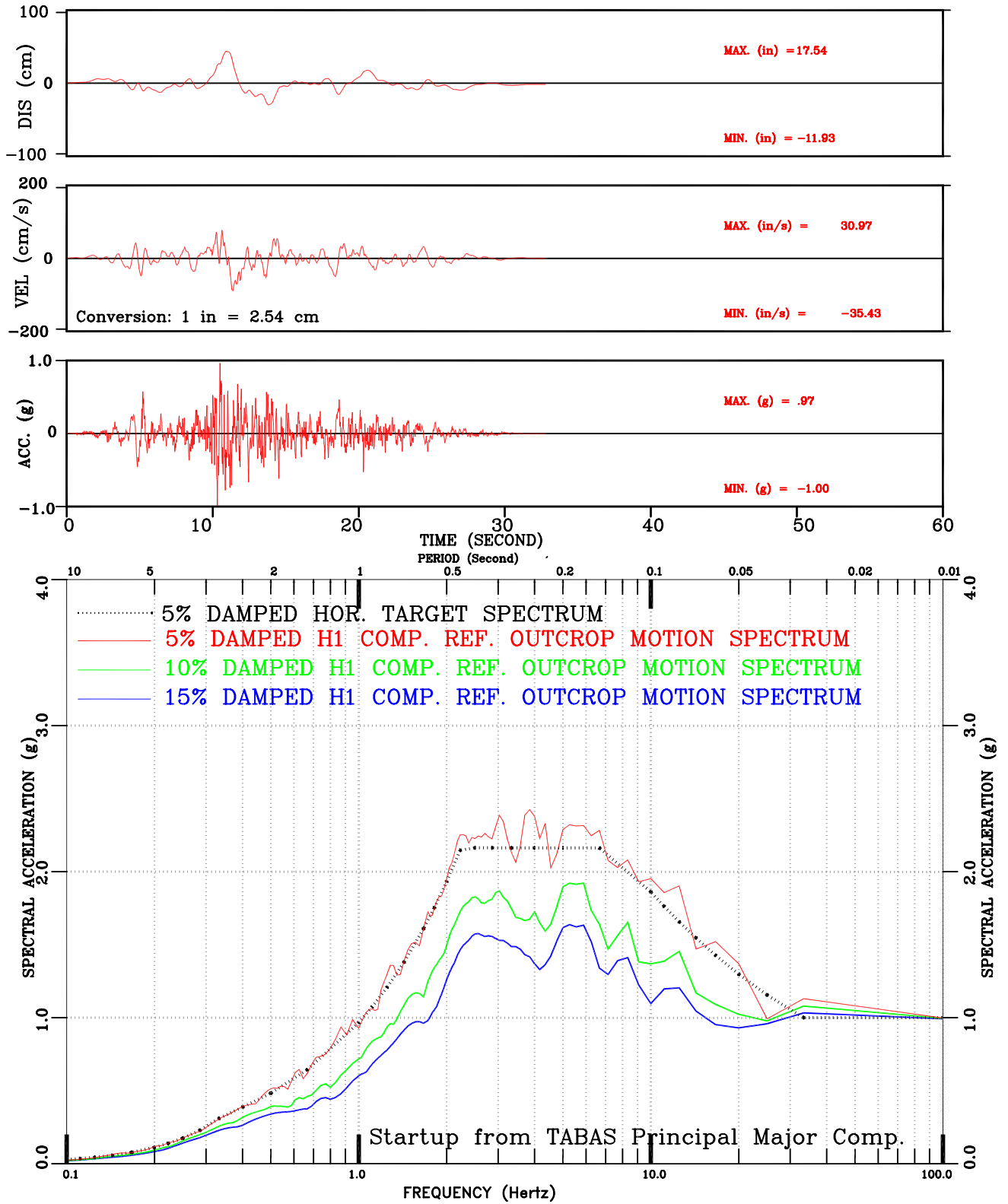


Figure III-1: Set-1 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

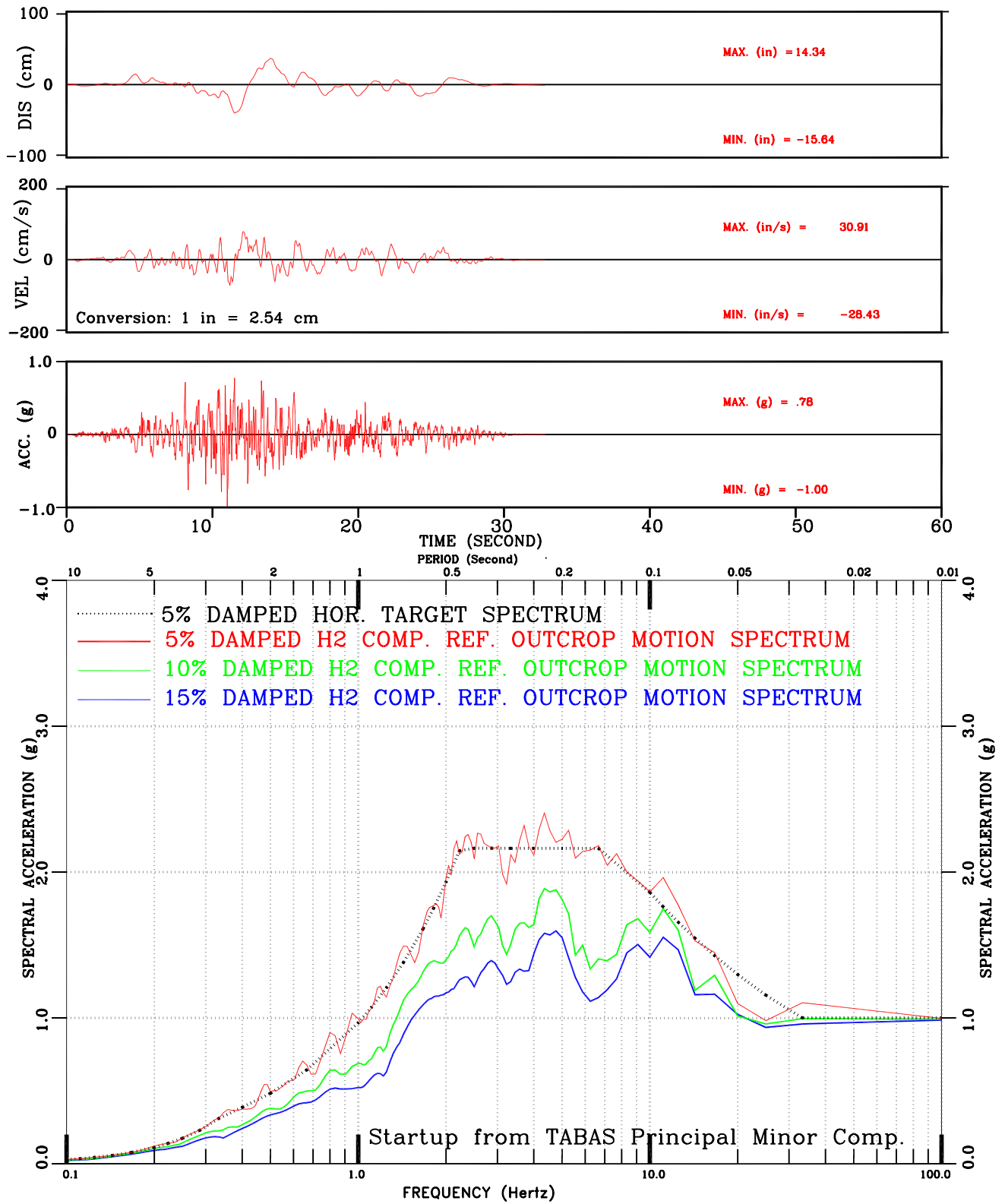


Figure III-2: Set-1 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

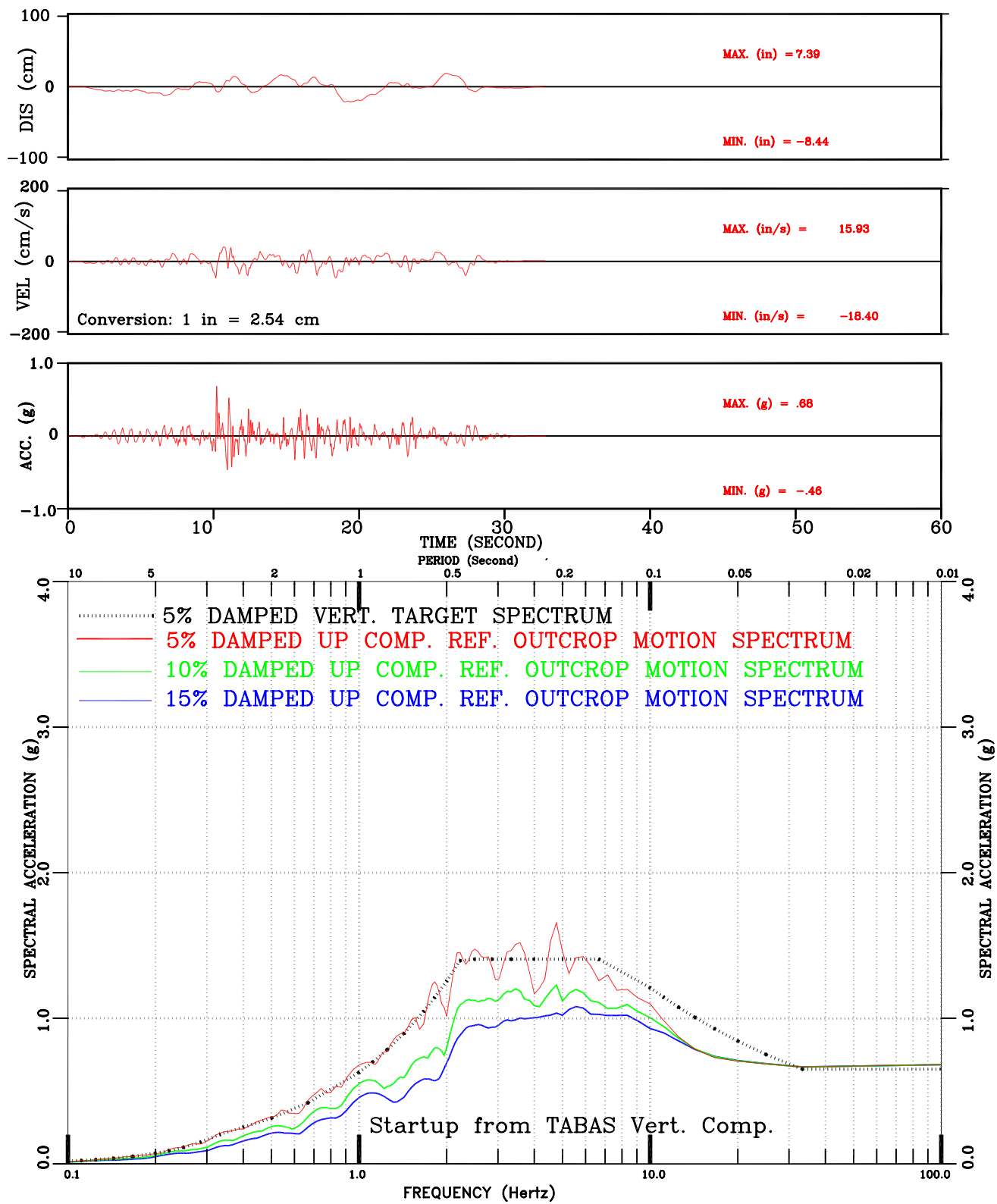


Figure III-3: Set-1 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

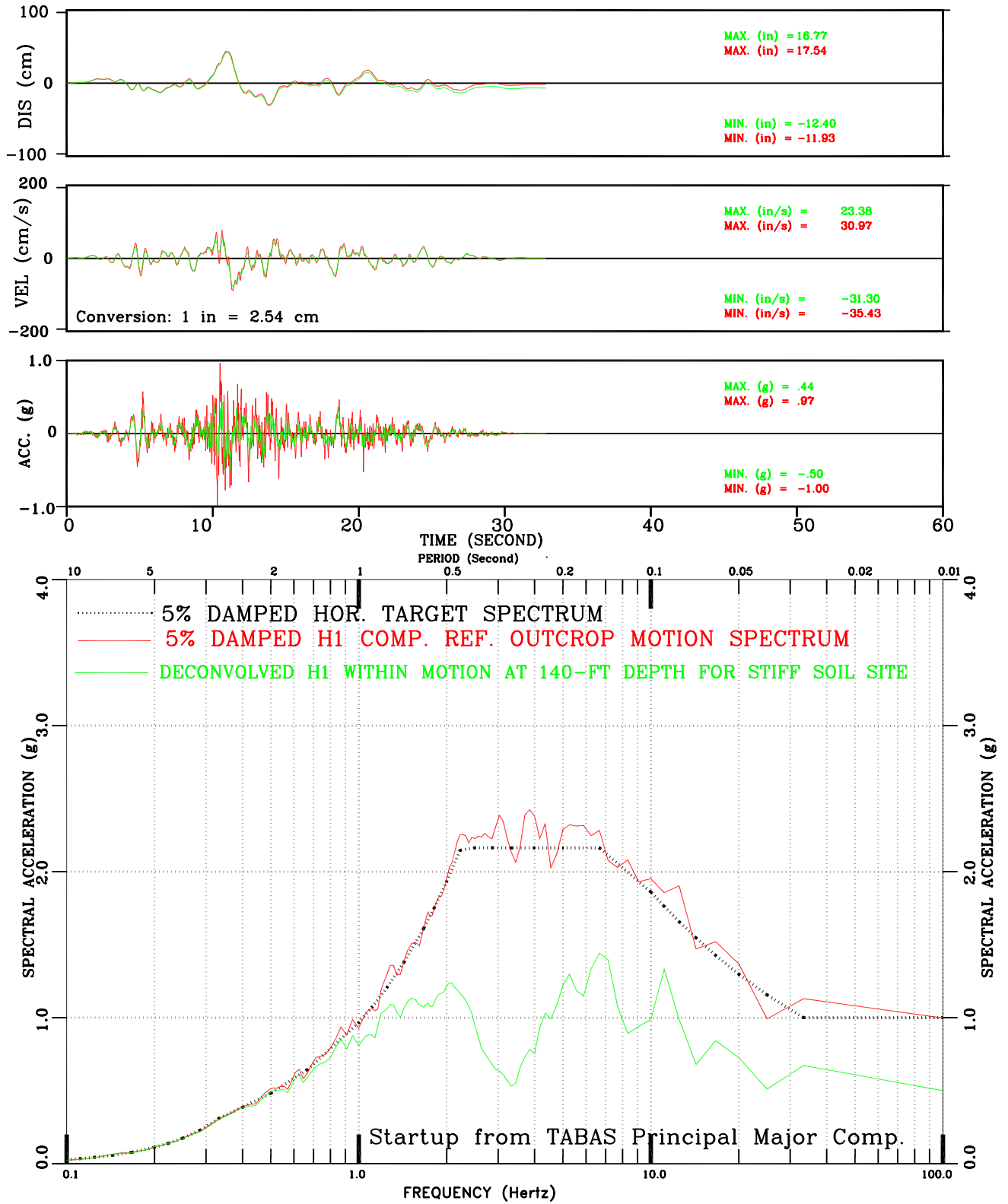


Figure III-4: Deconvolved Within vs. Surface Motion for Stiff Soil Set-1 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

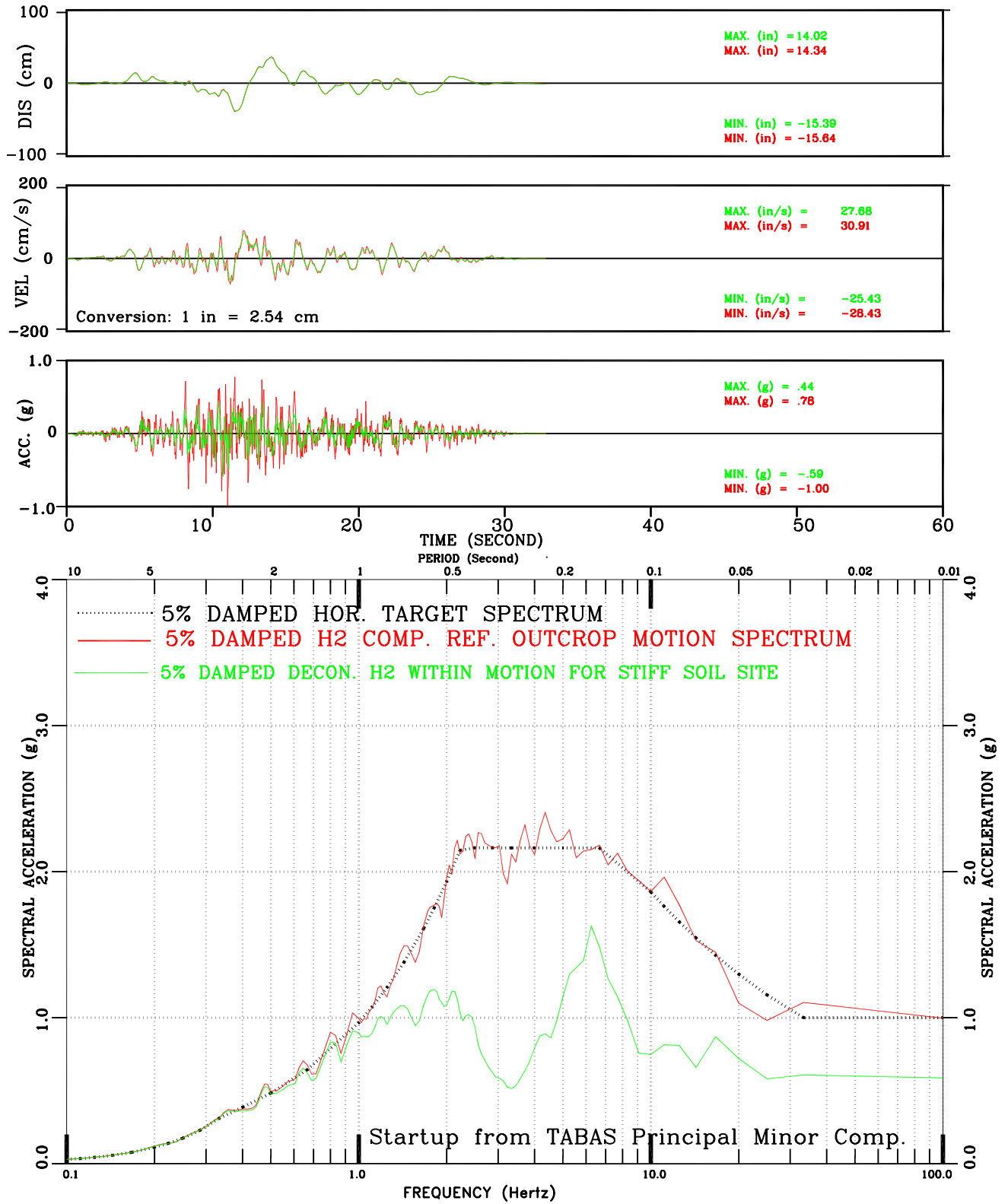


Figure III-5: Deconvolved Within vs. Surface Motion for Stiff Soil Set-1 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



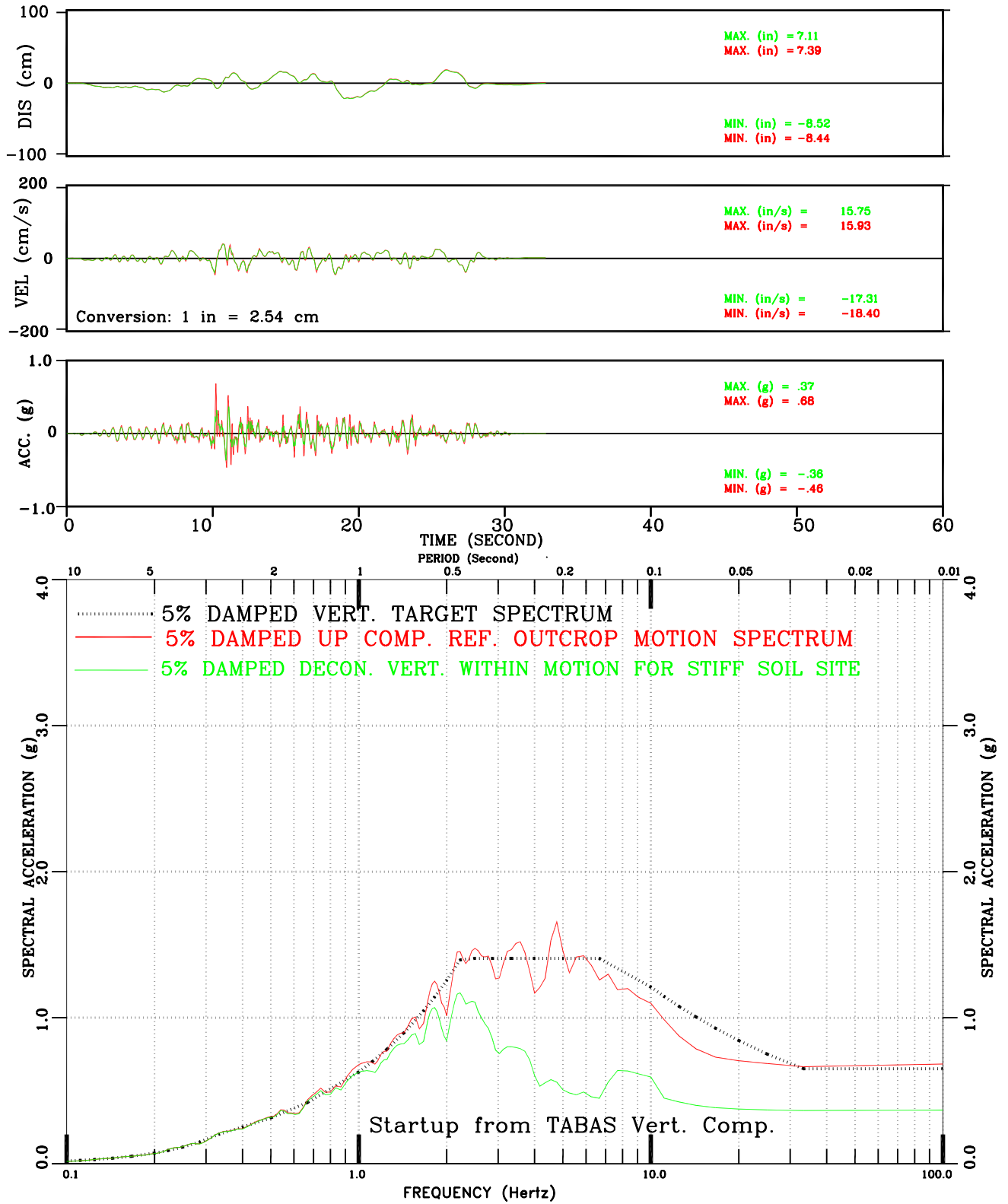


Figure III-6: Deconvolved Within vs. Surface Motion for Stiff Soil Set-1 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

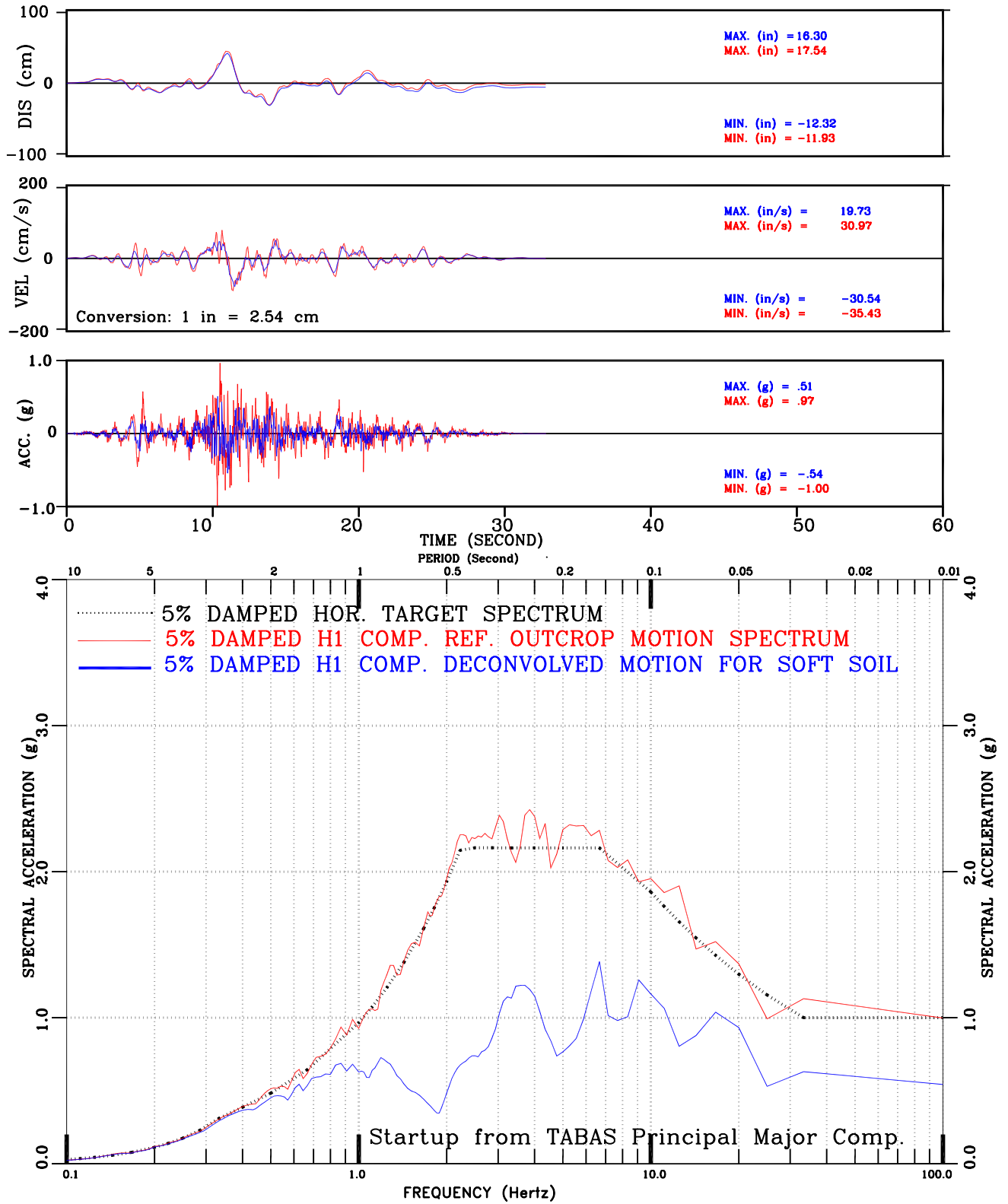


Figure III-7: Deconvolved Within vs. Surface Motion for Soft Soil Set-1 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

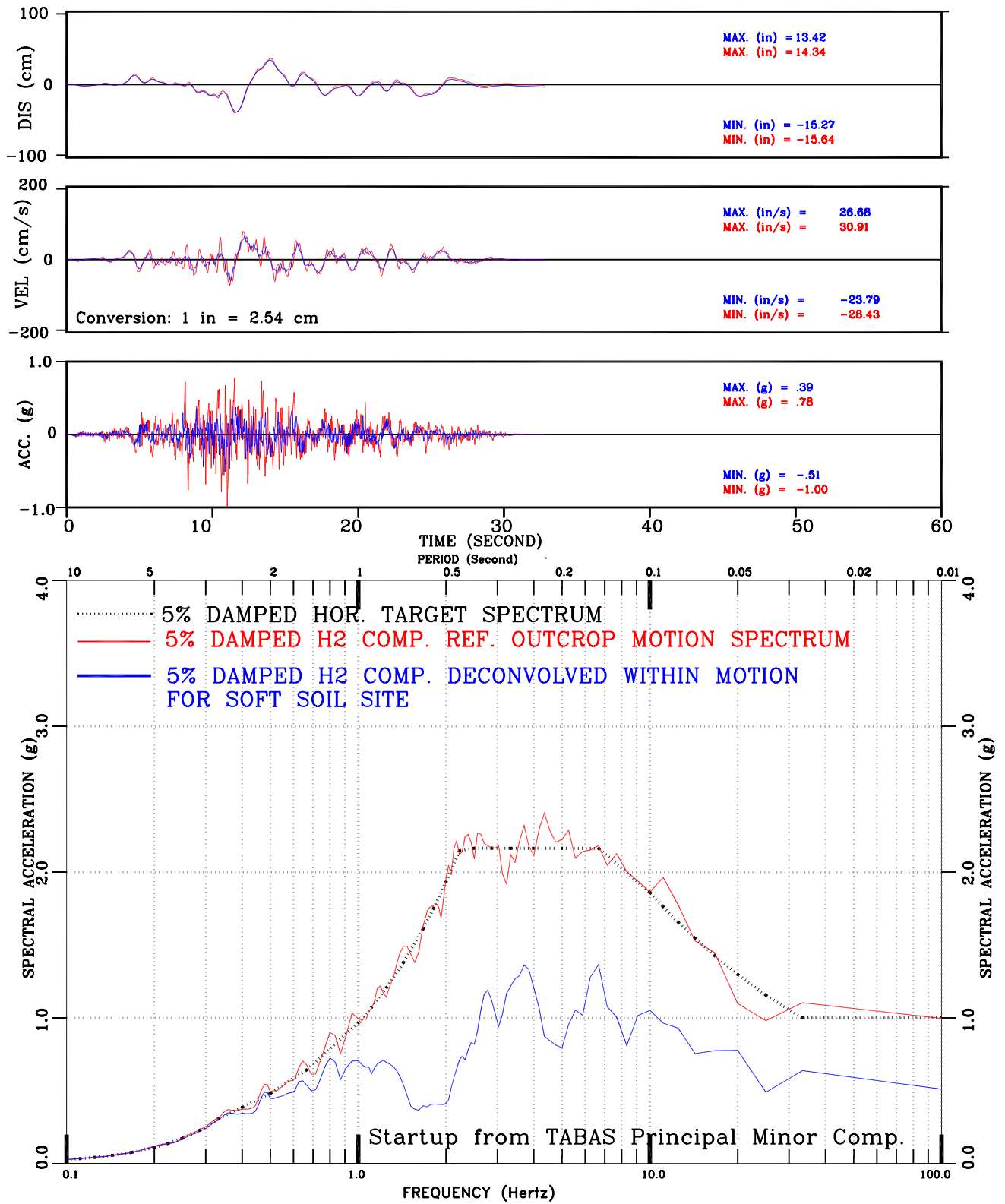


Figure III-8: Deconvolved Within vs. Surface Motion for Soft Soil Set-1 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

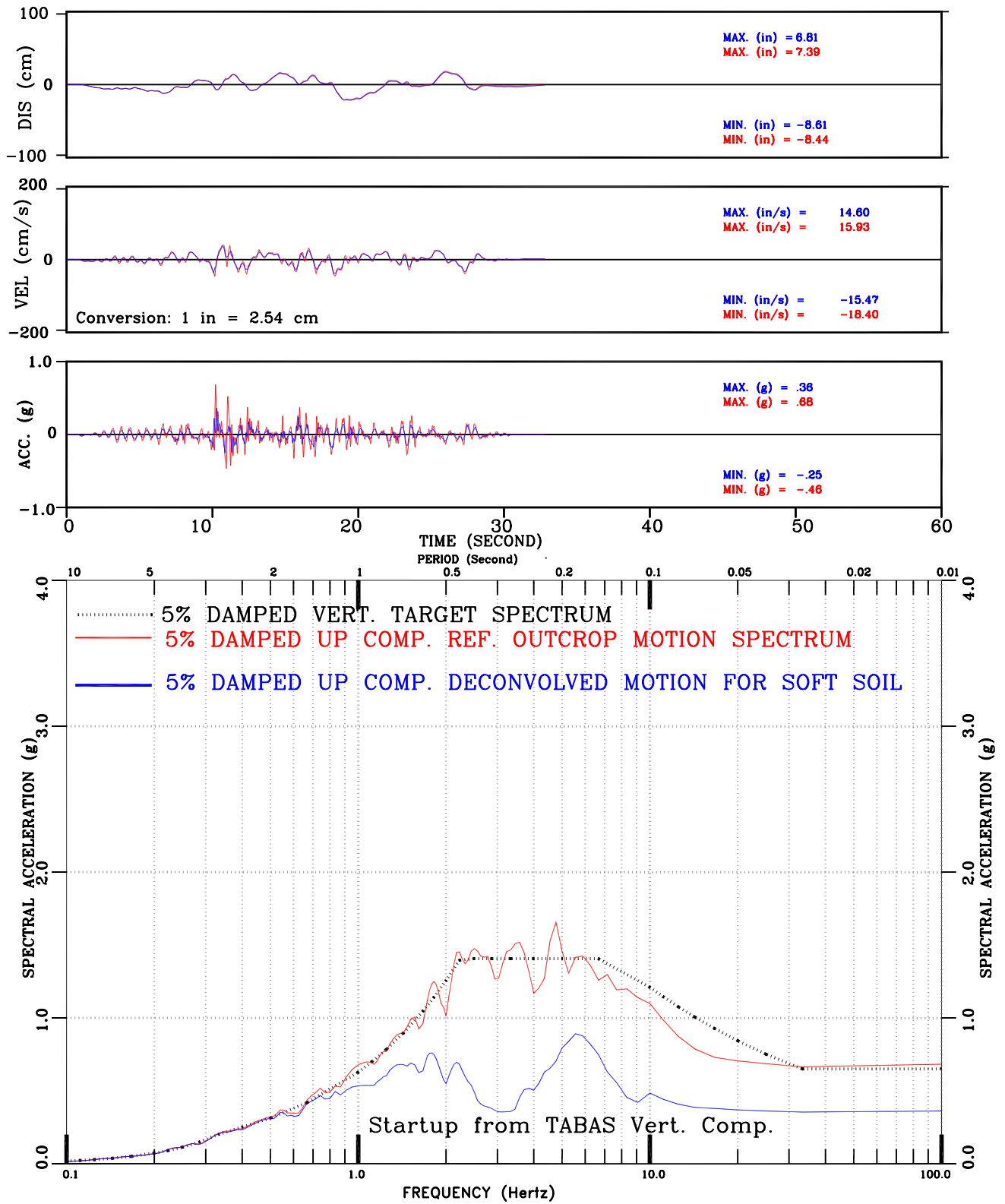


Figure III-9: Deconvolved Within vs. Surface Motion for Soft Soil Set-1 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

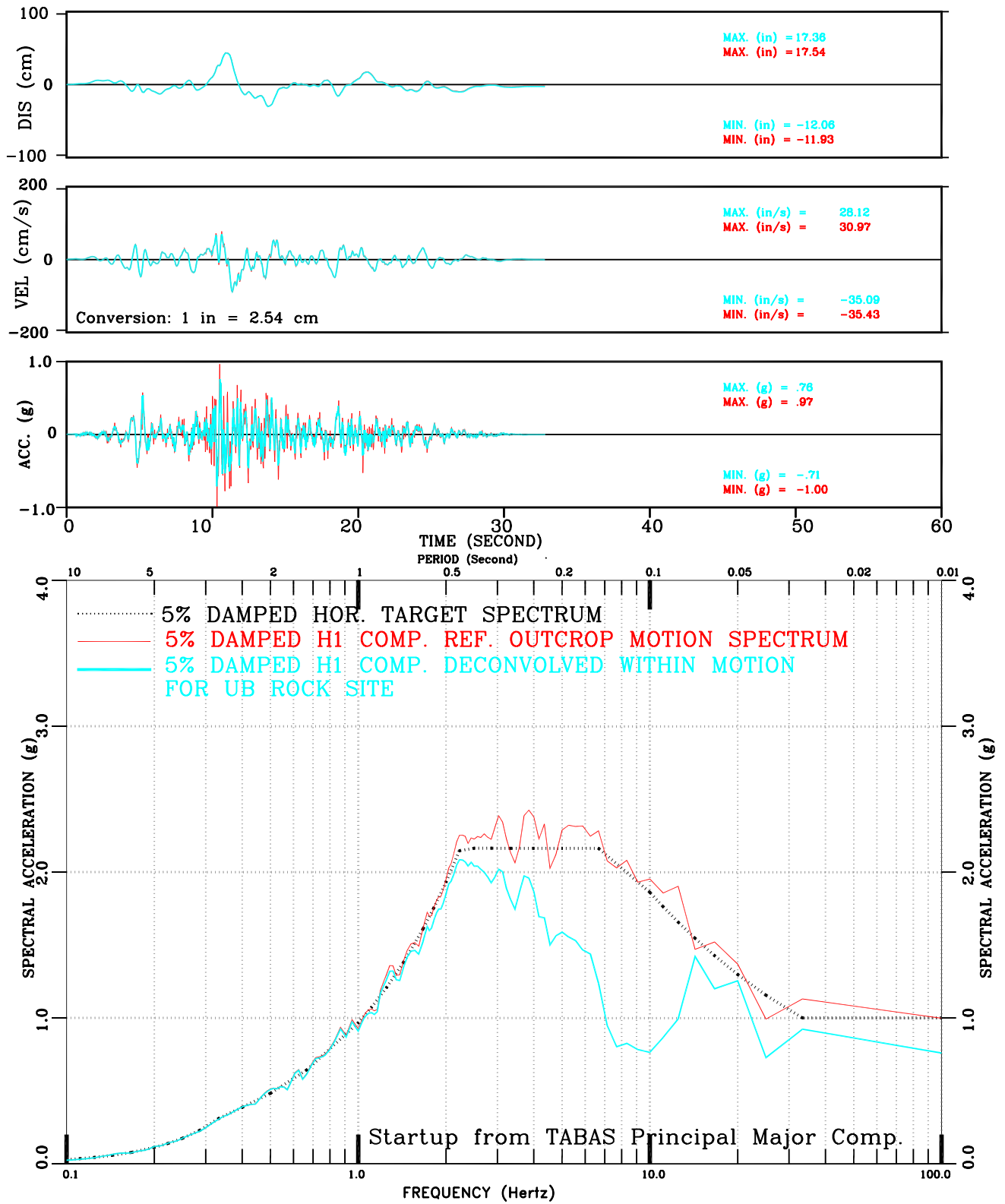


Figure III-10: Deconvolved Within vs. Surface Motion for UB Rock Set-1 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

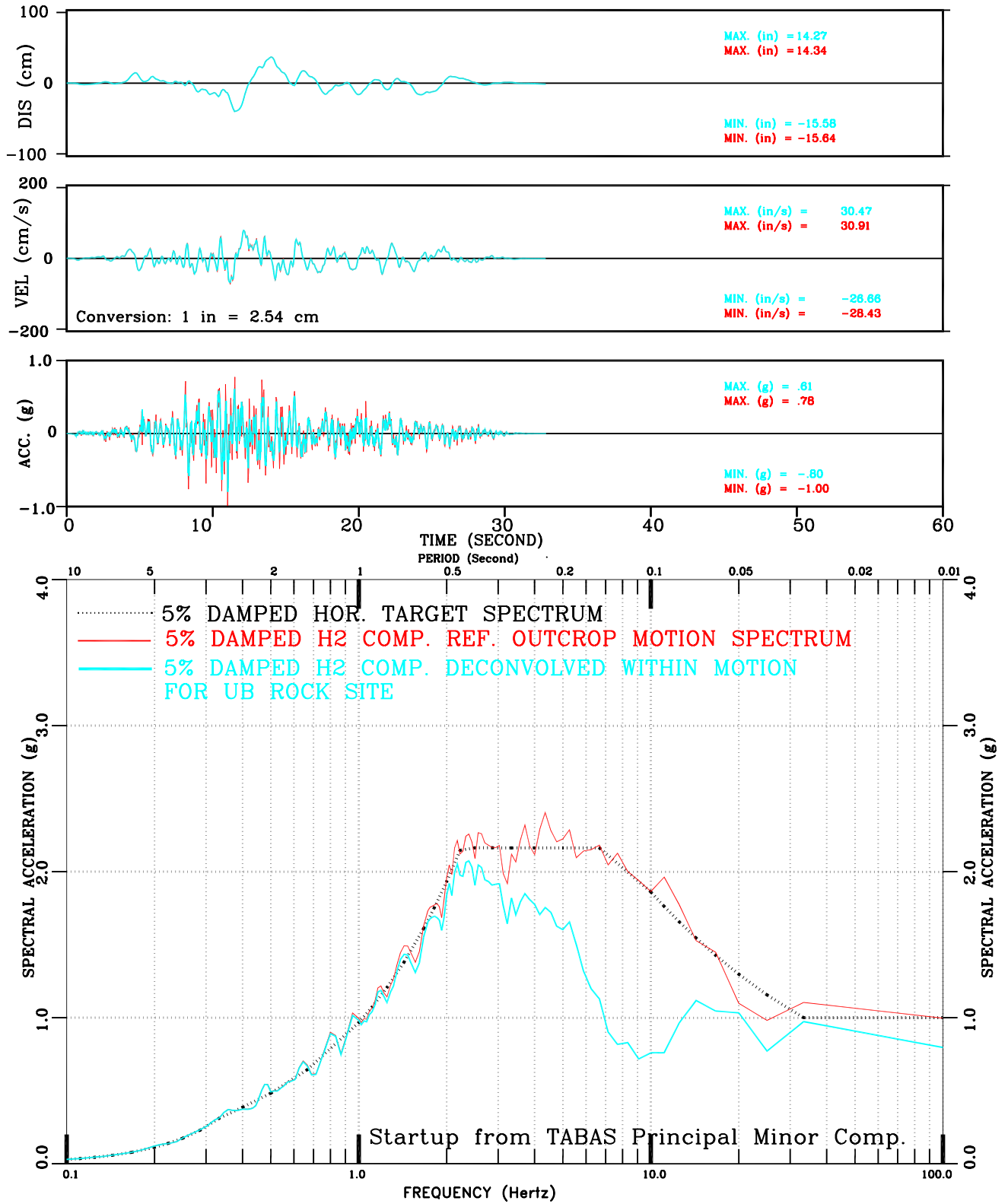


Figure III-11: Deconvolved Within vs. Surface Motion for UB Rock Set-1 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

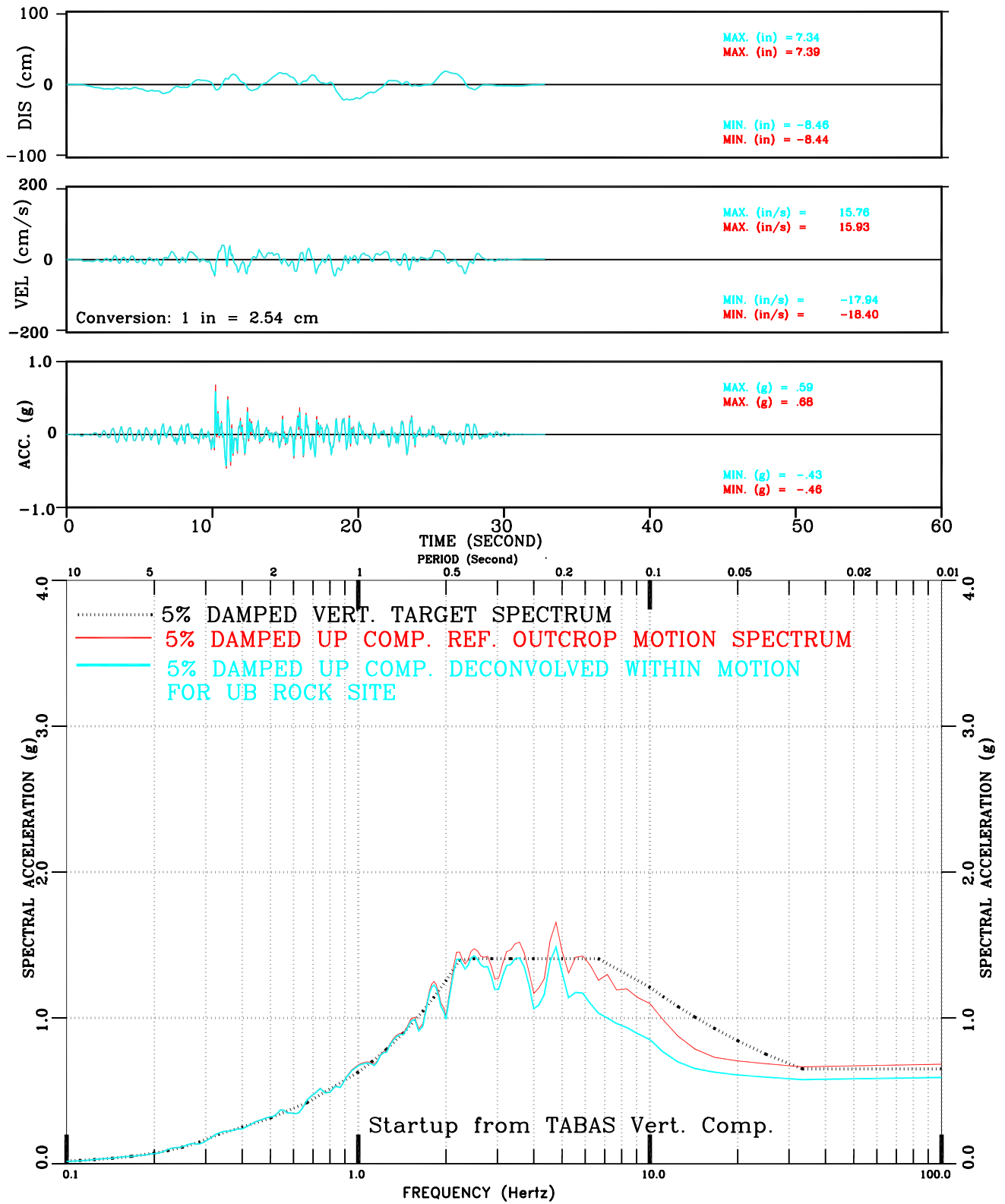


Figure III-12: Deconvolved Within vs. Surface Motion for UB Rock Set-1 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

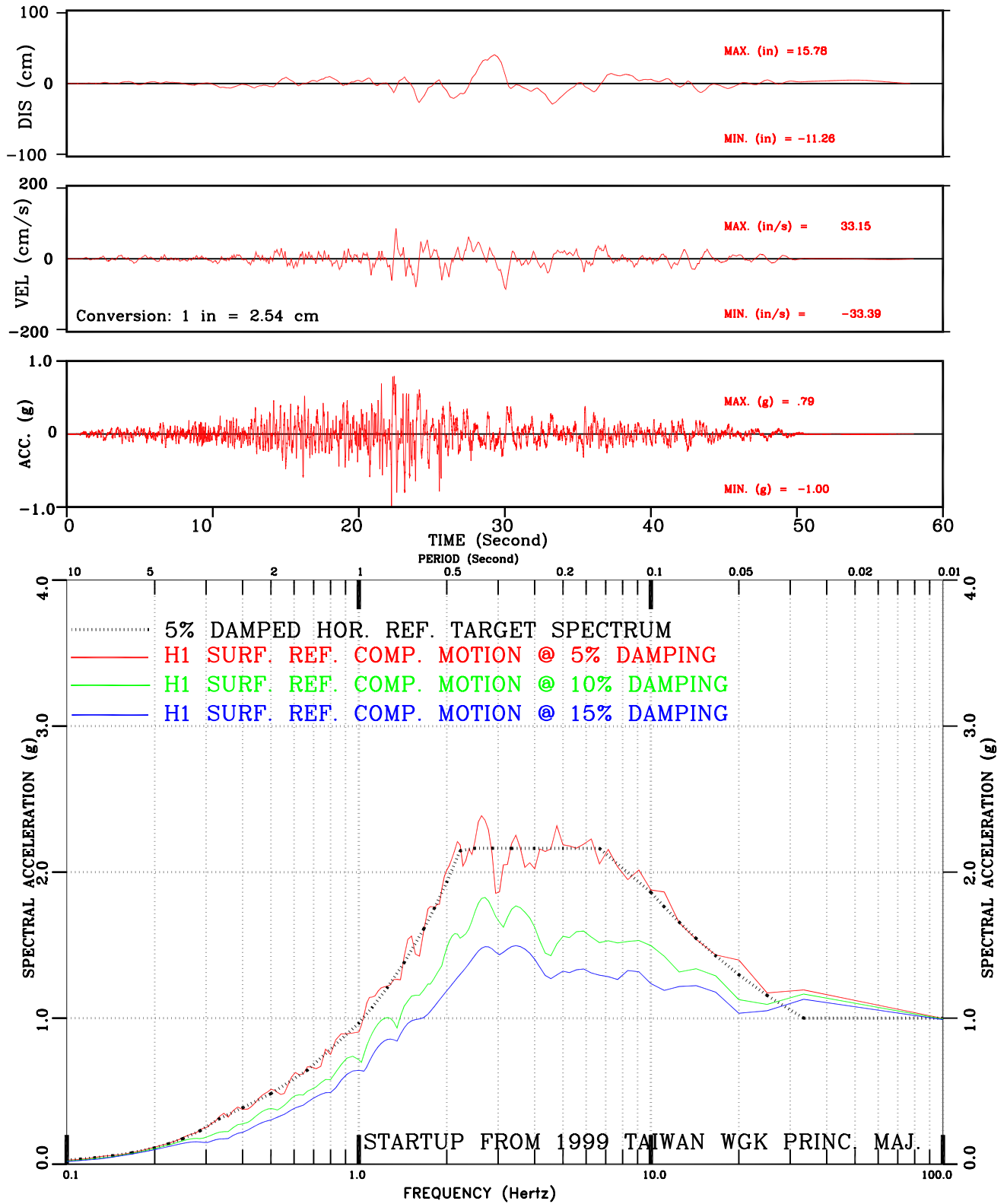


Figure III-13: Set-2 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



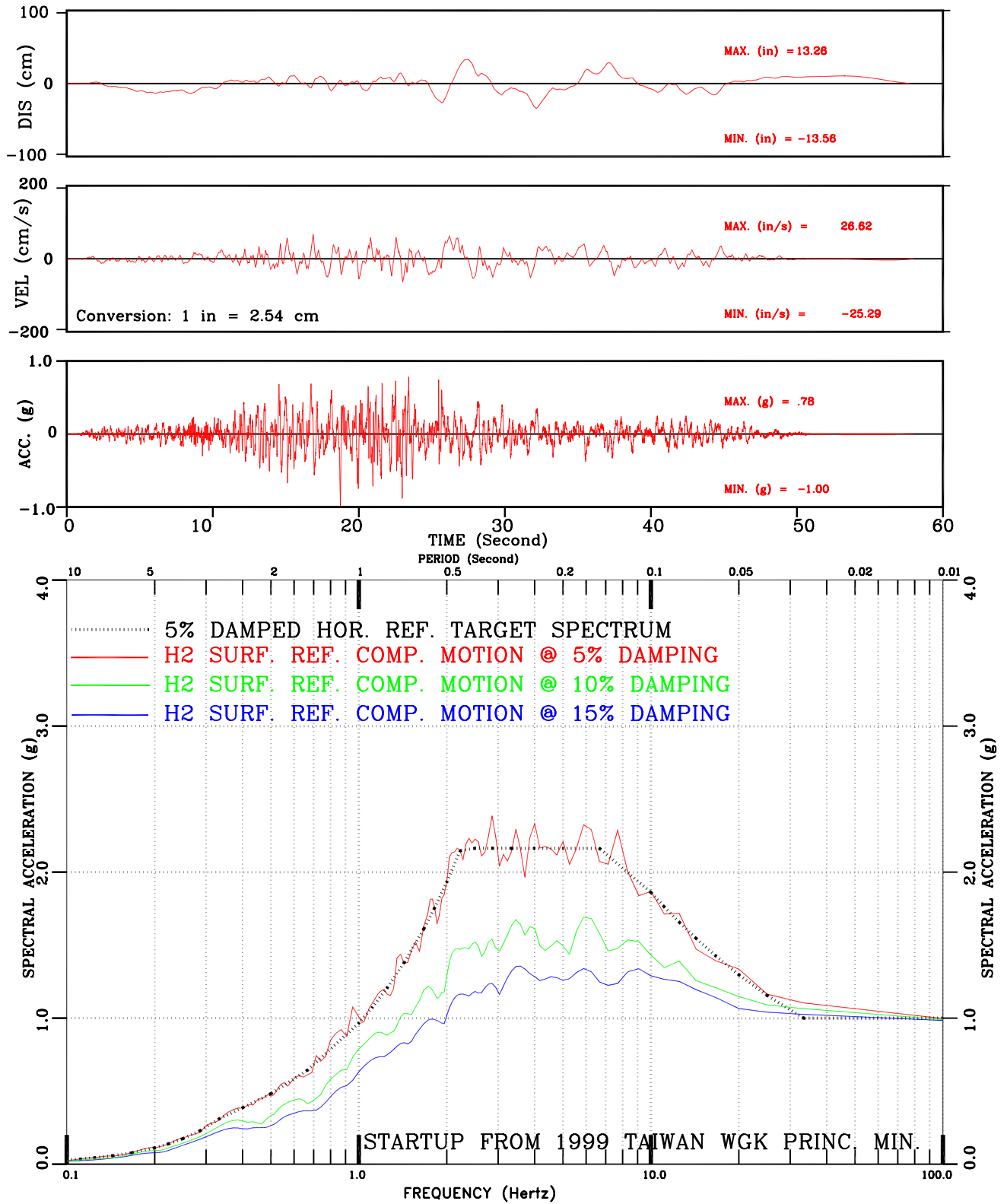


Figure III-14: Set-2 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

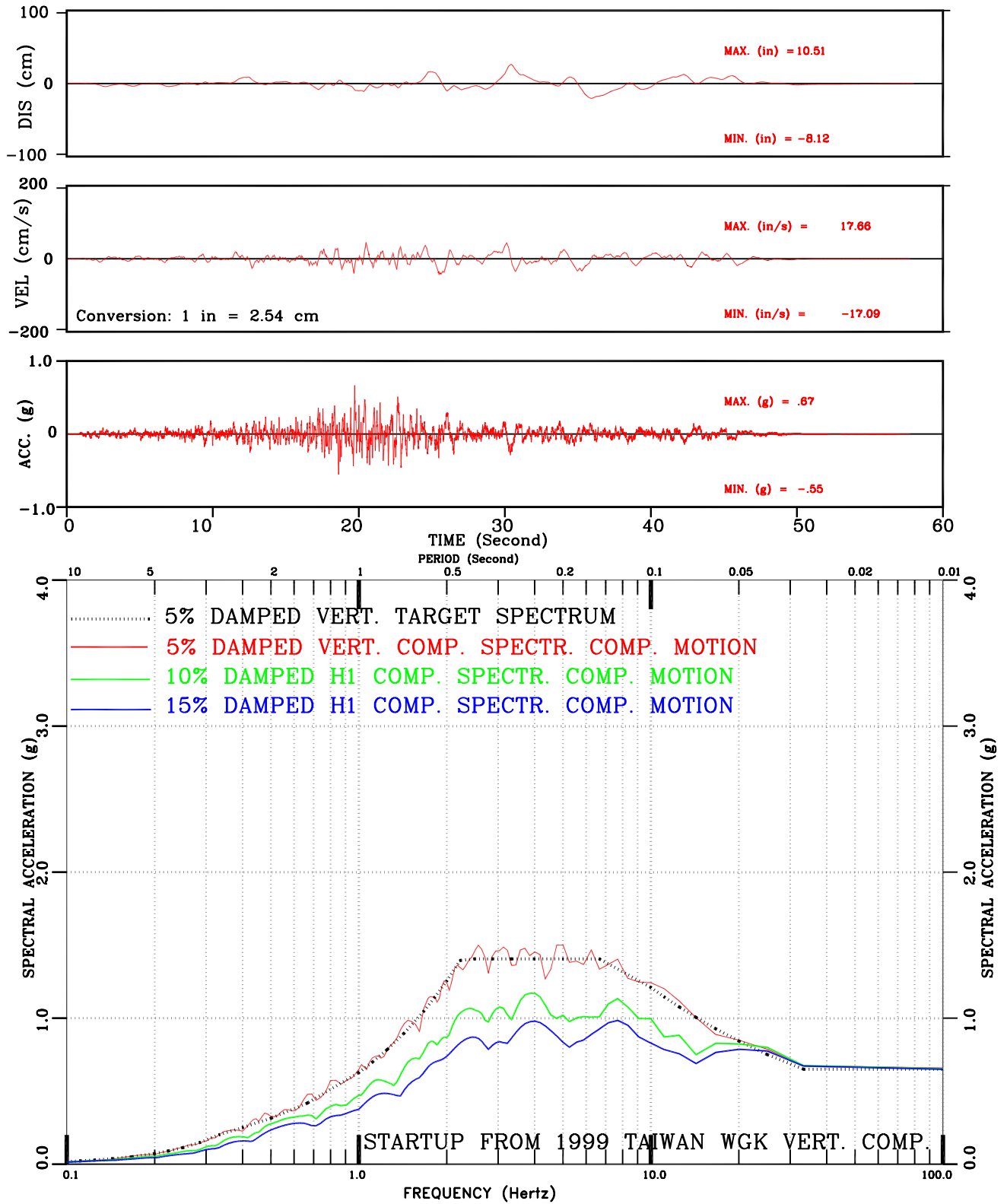


Figure III-15: Set-2 Up Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

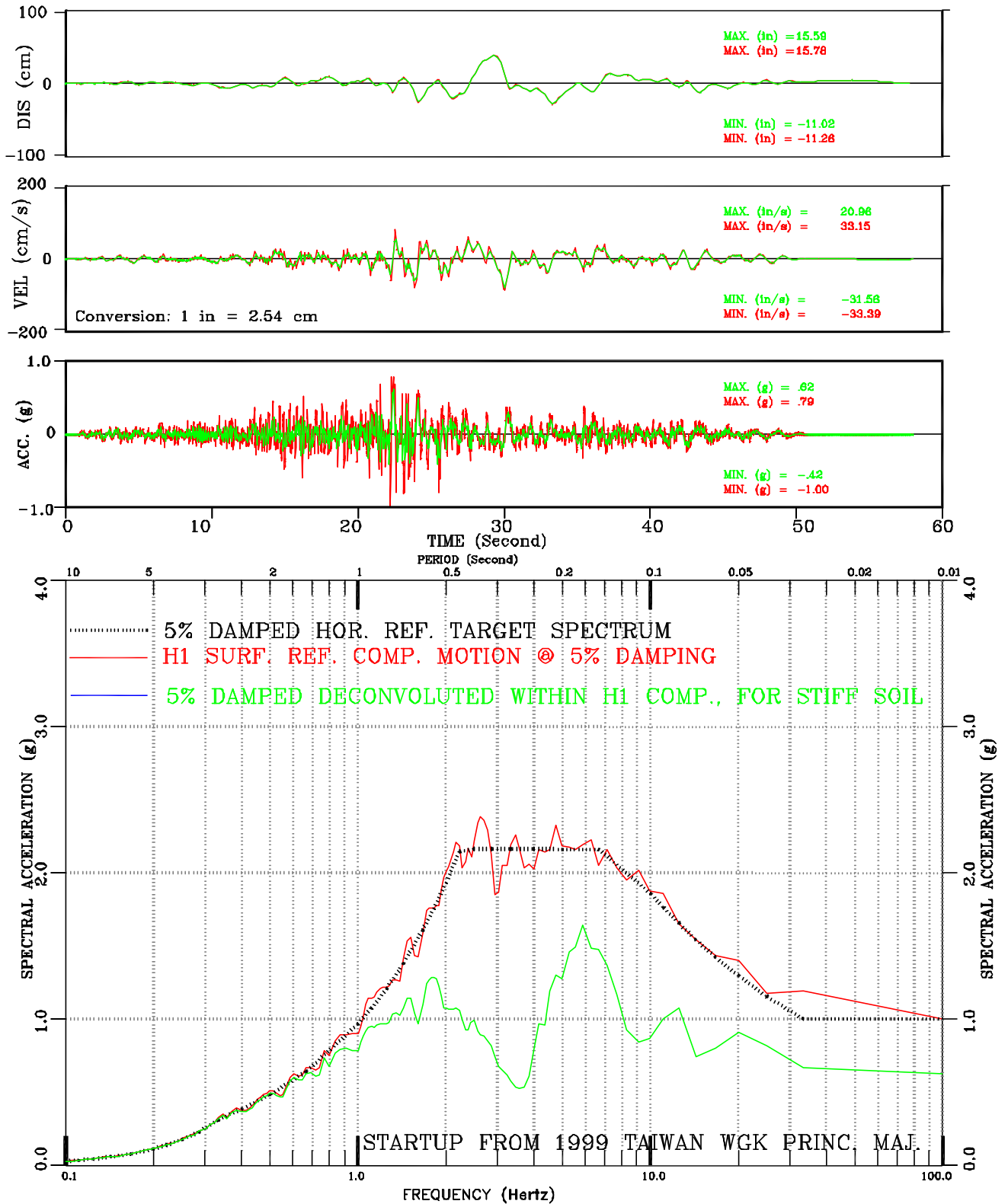


Figure III-16: Deconvoluted Within vs. Surface Motion for Stiff Soil Set-2 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

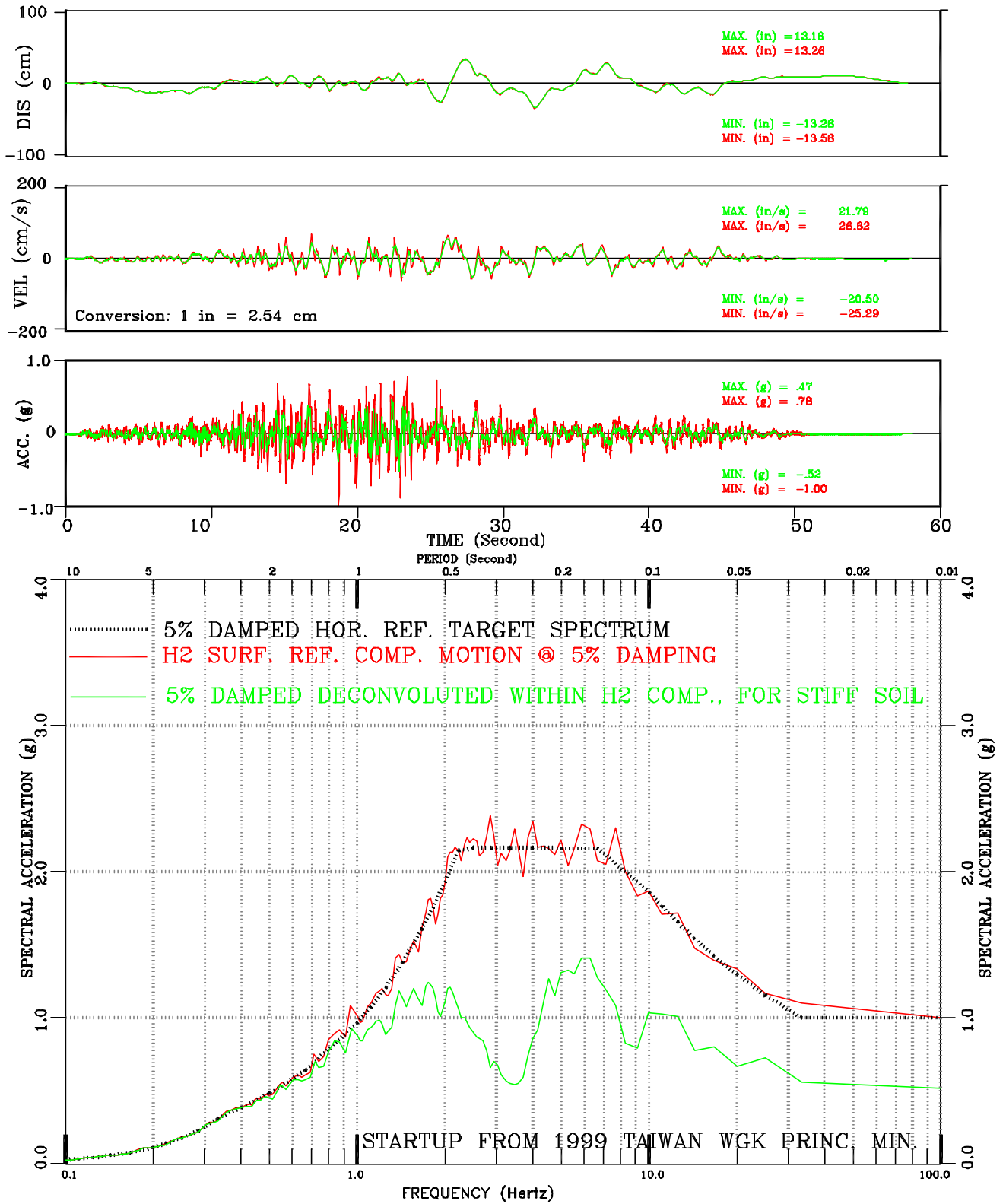


Figure III-17: Deconvoluted Within vs. Surface Motion for Stiff Soil Set-2 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

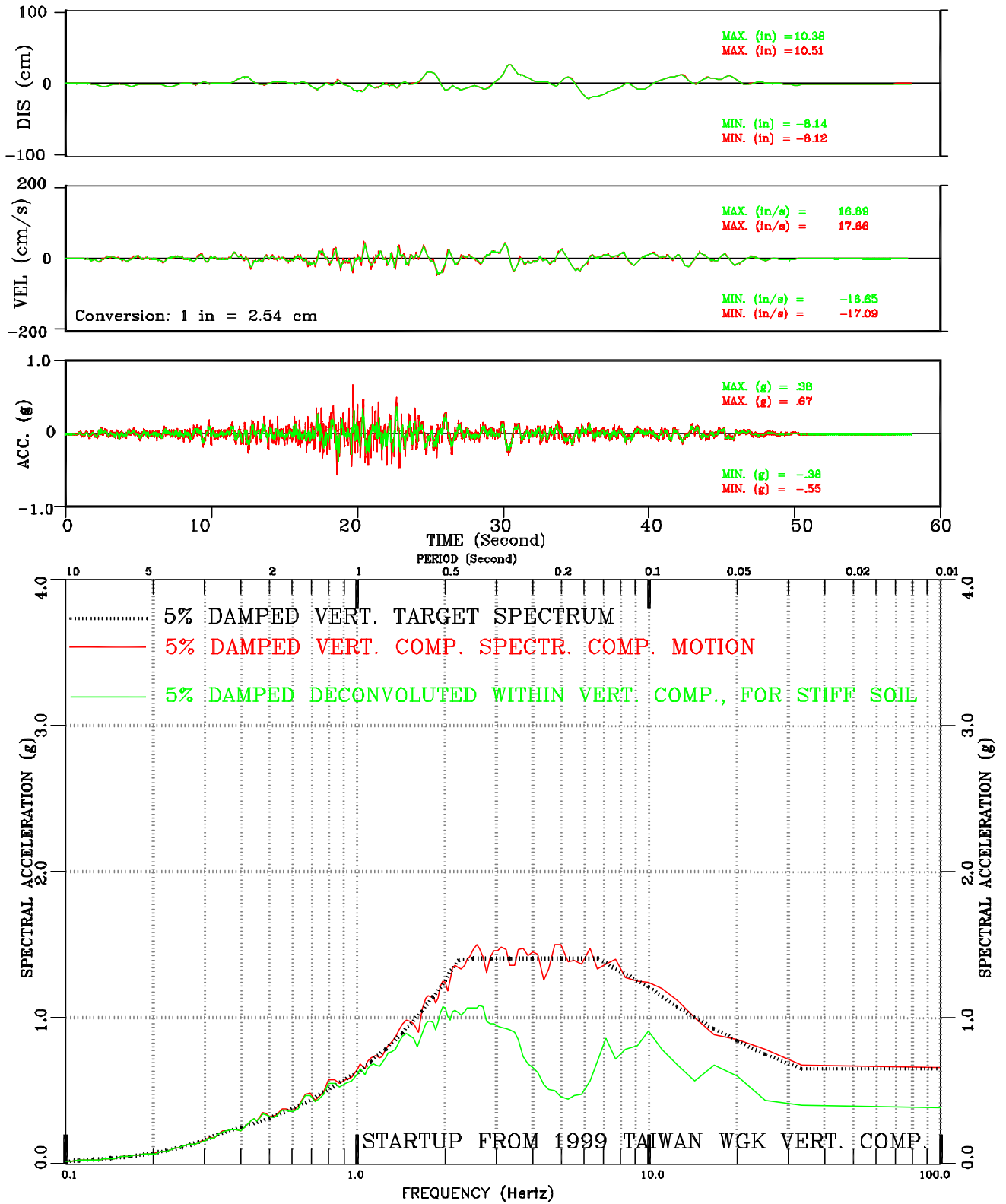


Figure III-18: Deconvoluted Within vs. Surface Motion for Stiff Soil Set-2 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

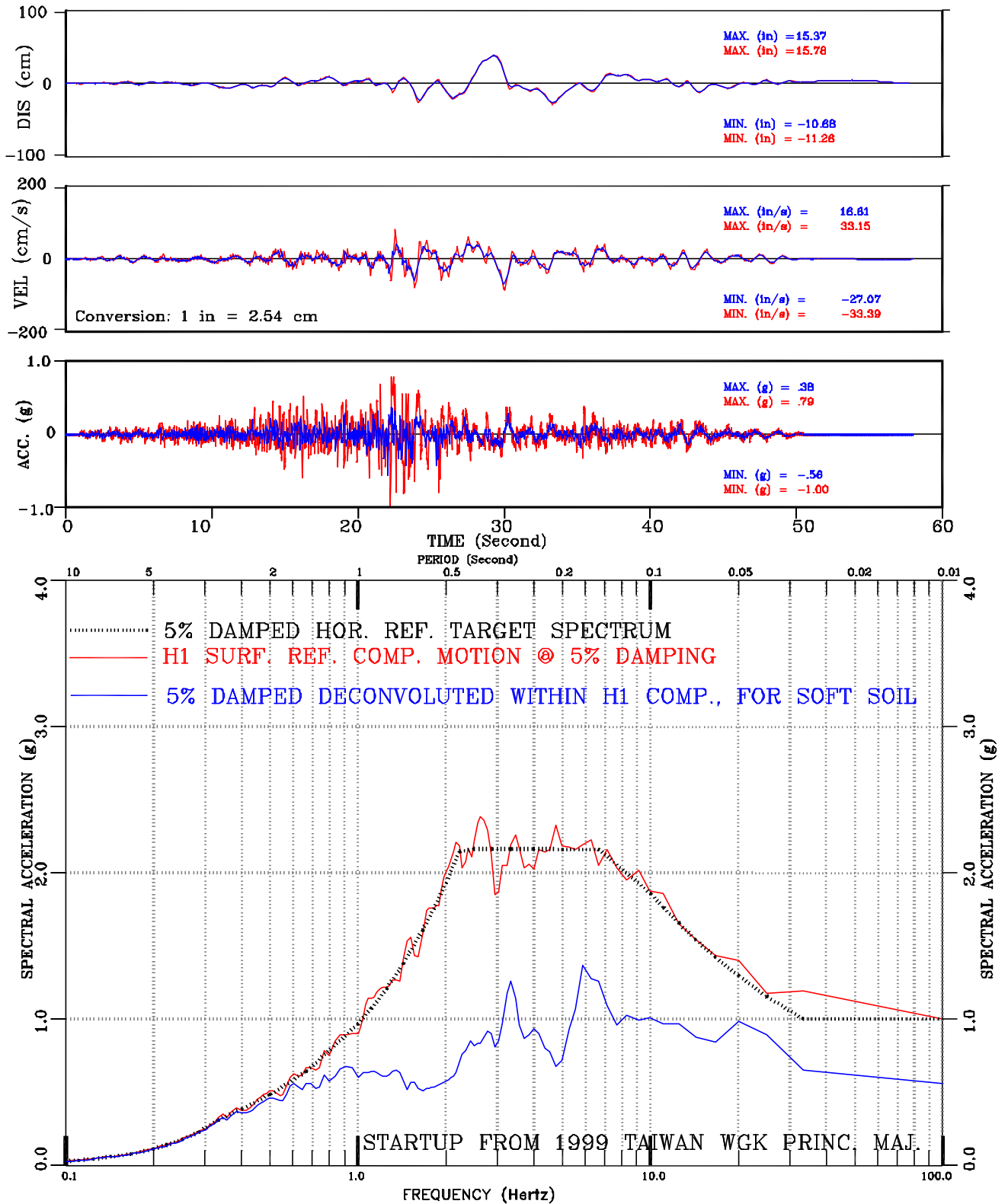


Figure III-19: Deconvoluted Within vs. Surface Motion for Soft Soil Set-2 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

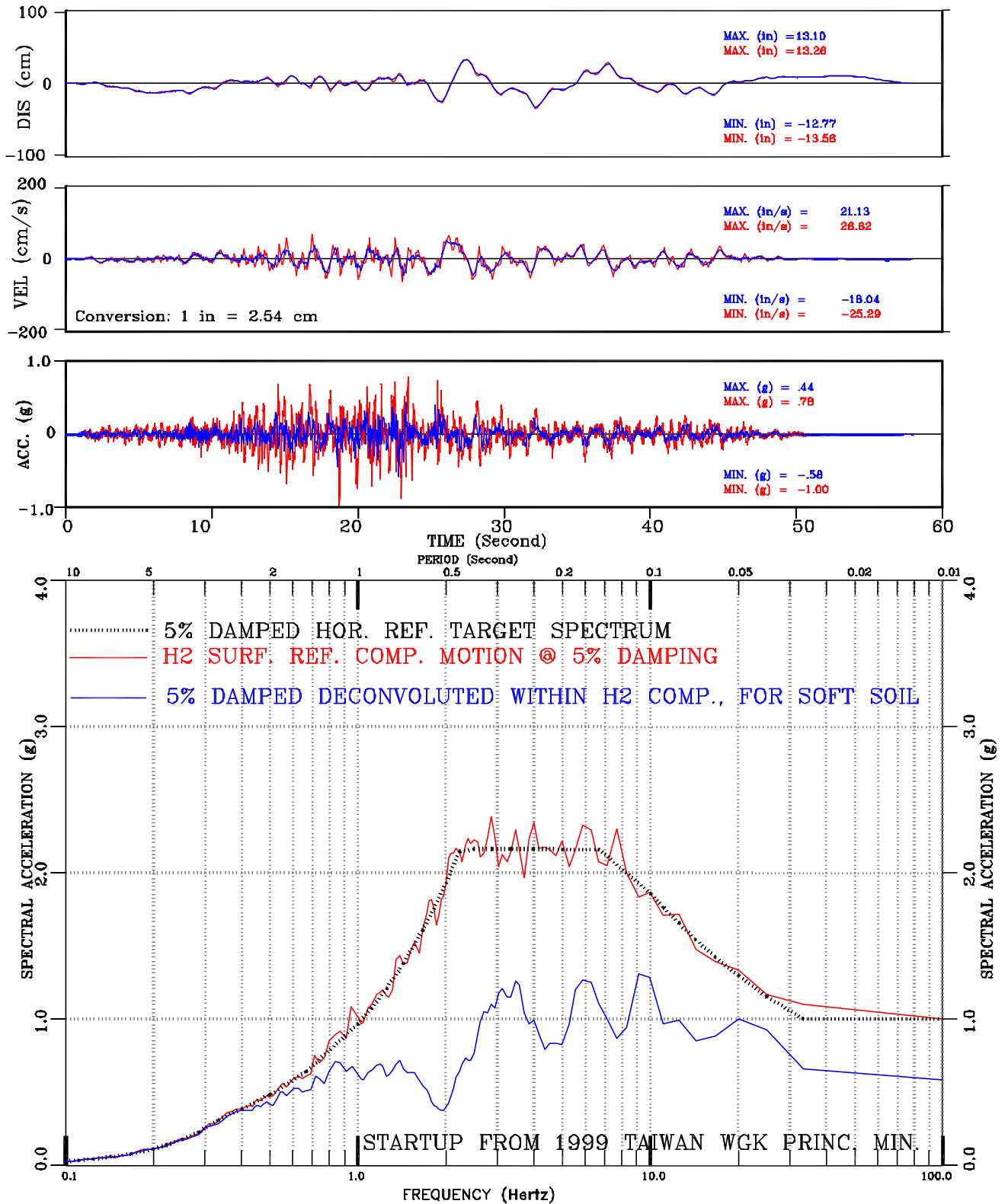


Figure III-20: Deconvoluted Within vs. Surface Motion for Soft Soil Set-2 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

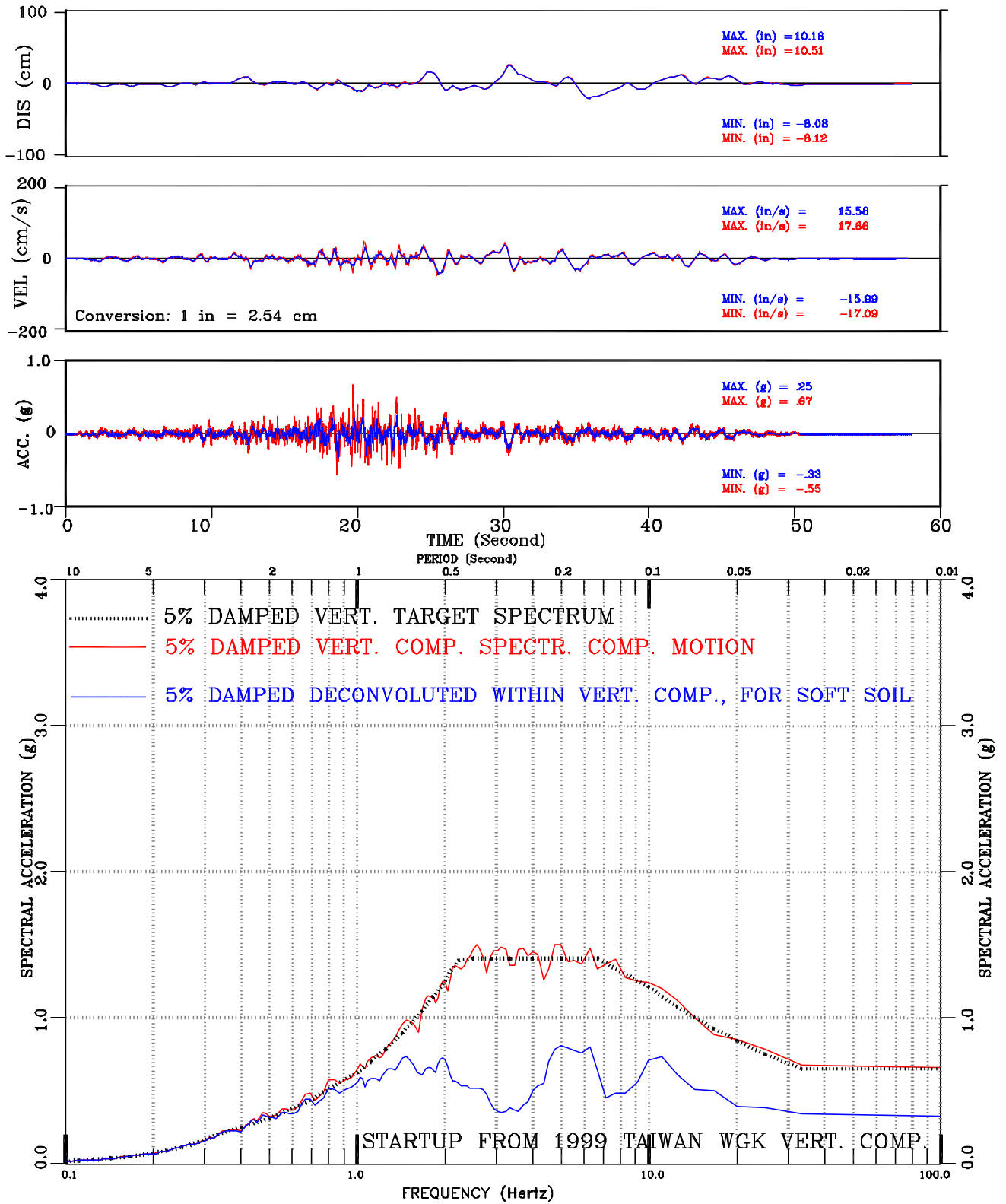


Figure III-21: Deconvoluted Within vs. Surface Motion for Soft Soil Set-2 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



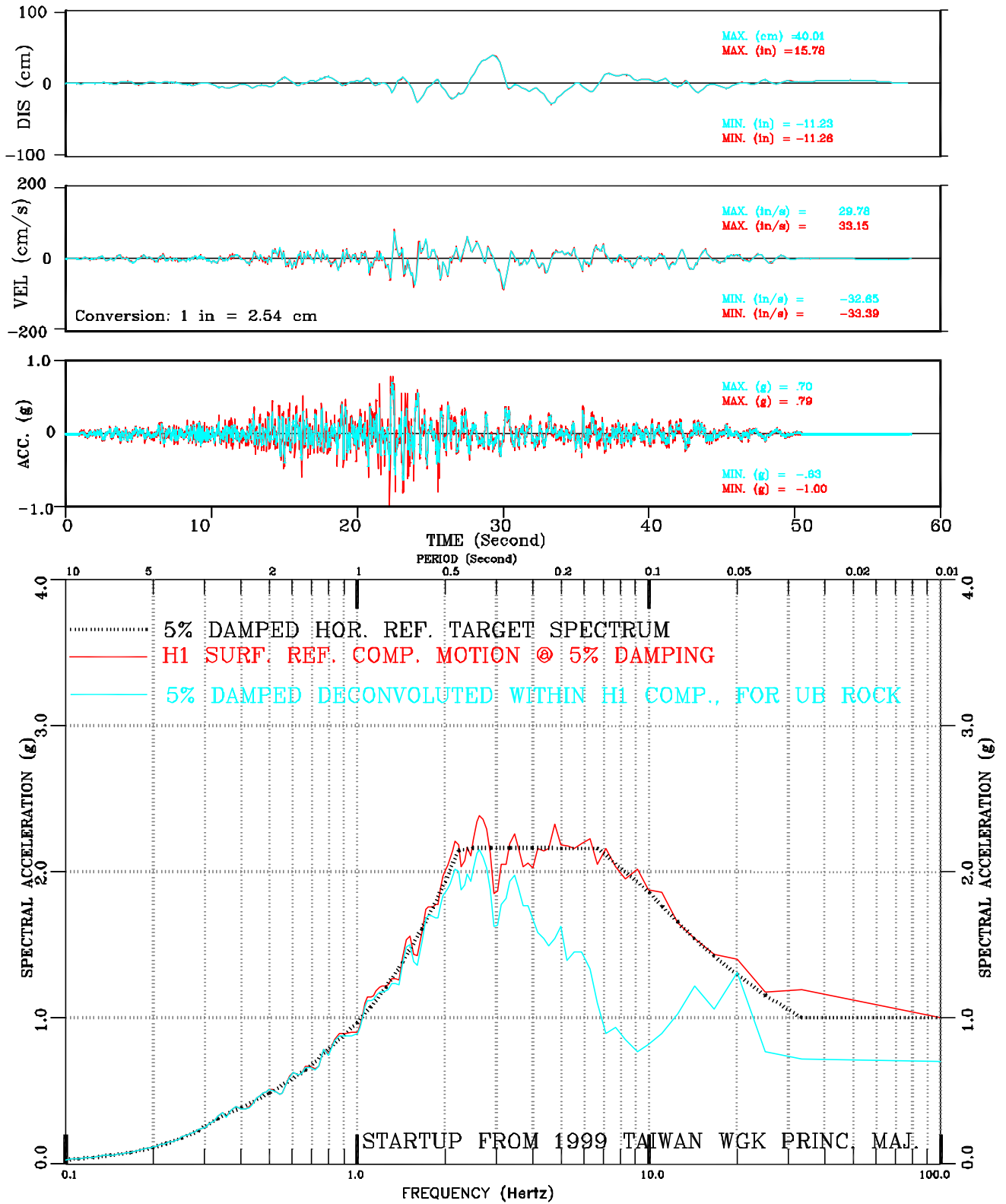


Figure III-22: Deconvoluted Within vs. Surface Motion for UB Rock Set-2 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

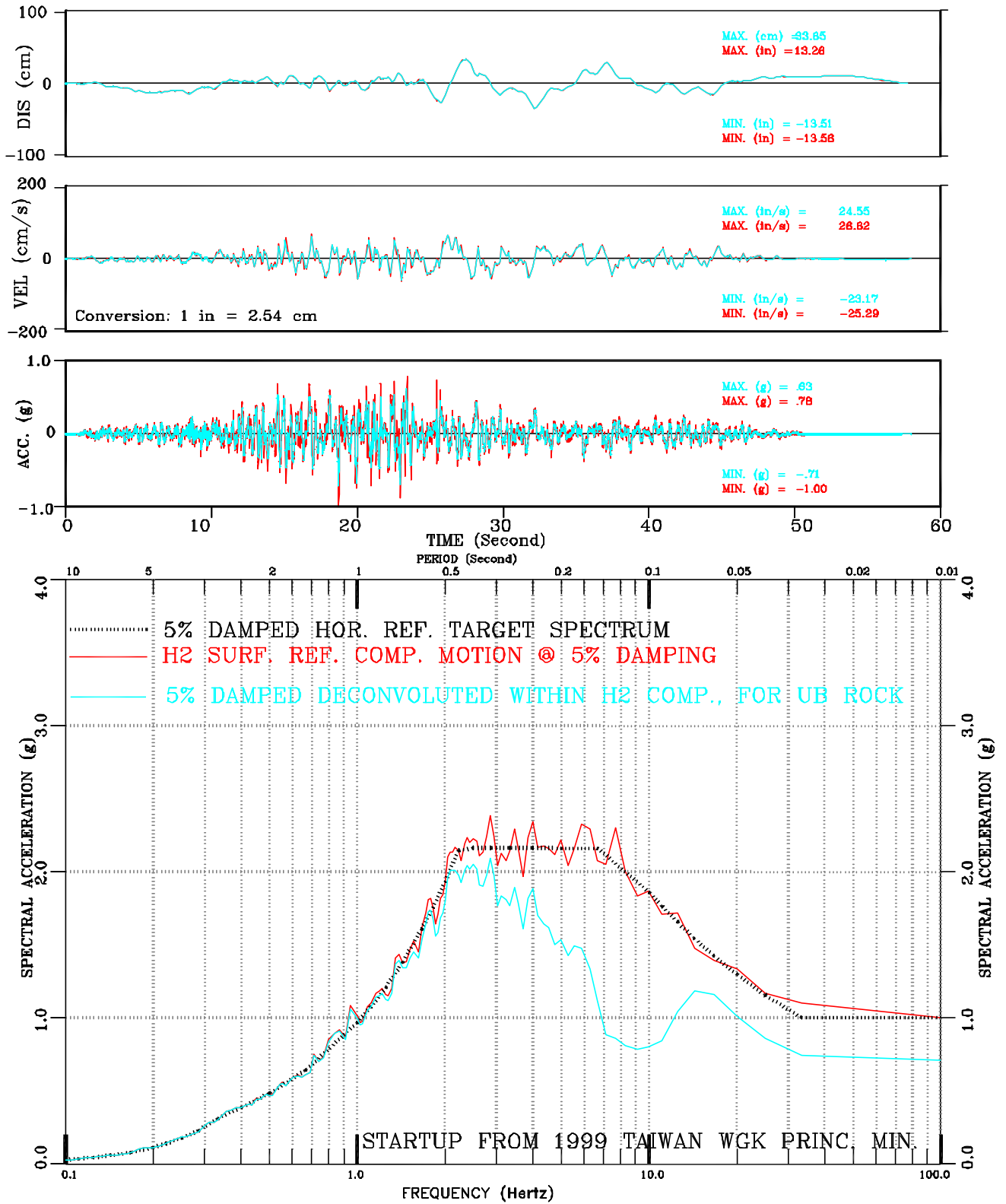


Figure III-23: Deconvoluted Within vs. Surface Motion for UB Rock Set-2 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

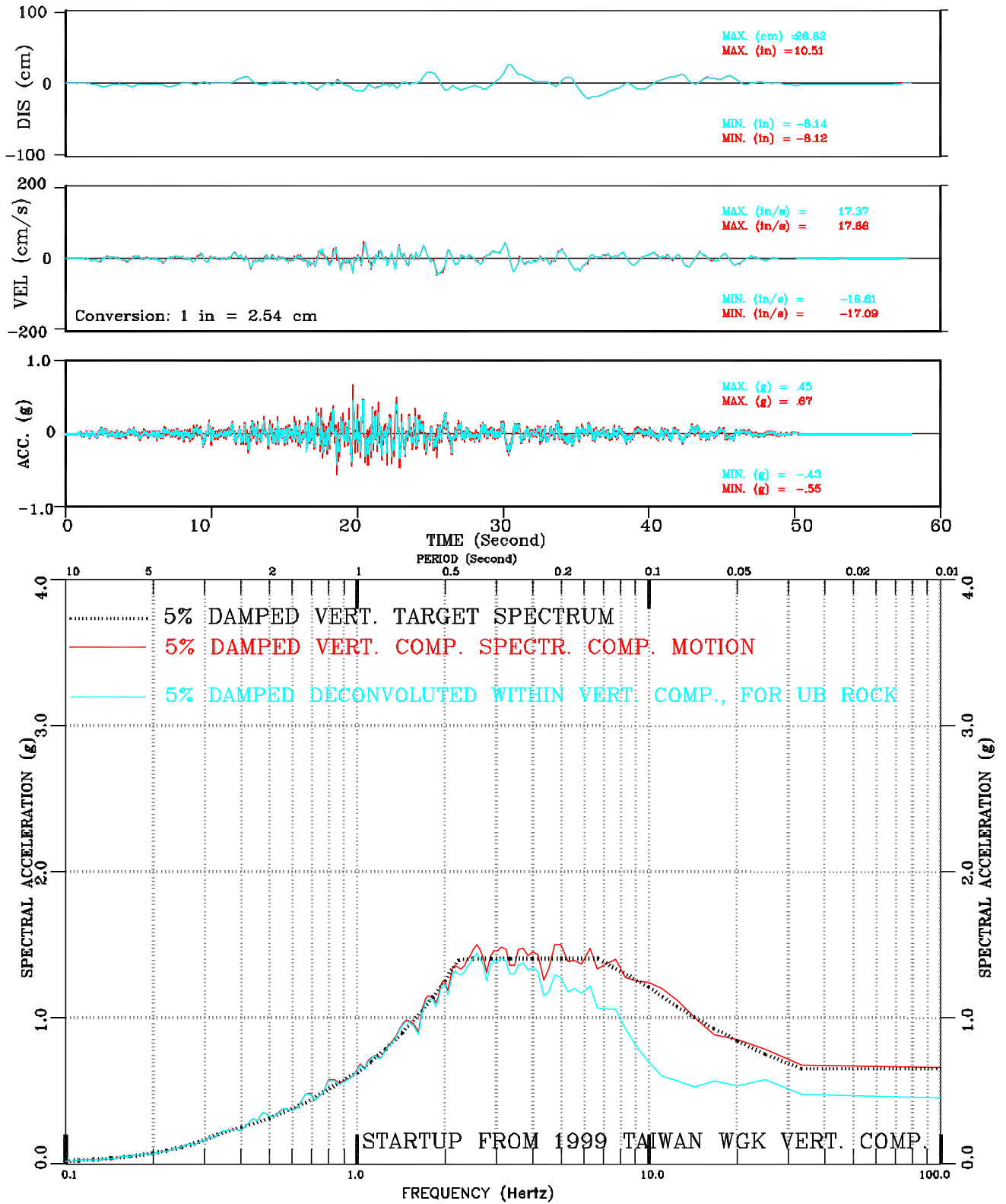


Figure III-24: Deconvoluted Within vs. Surface Motion for UB Rock Set-2 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

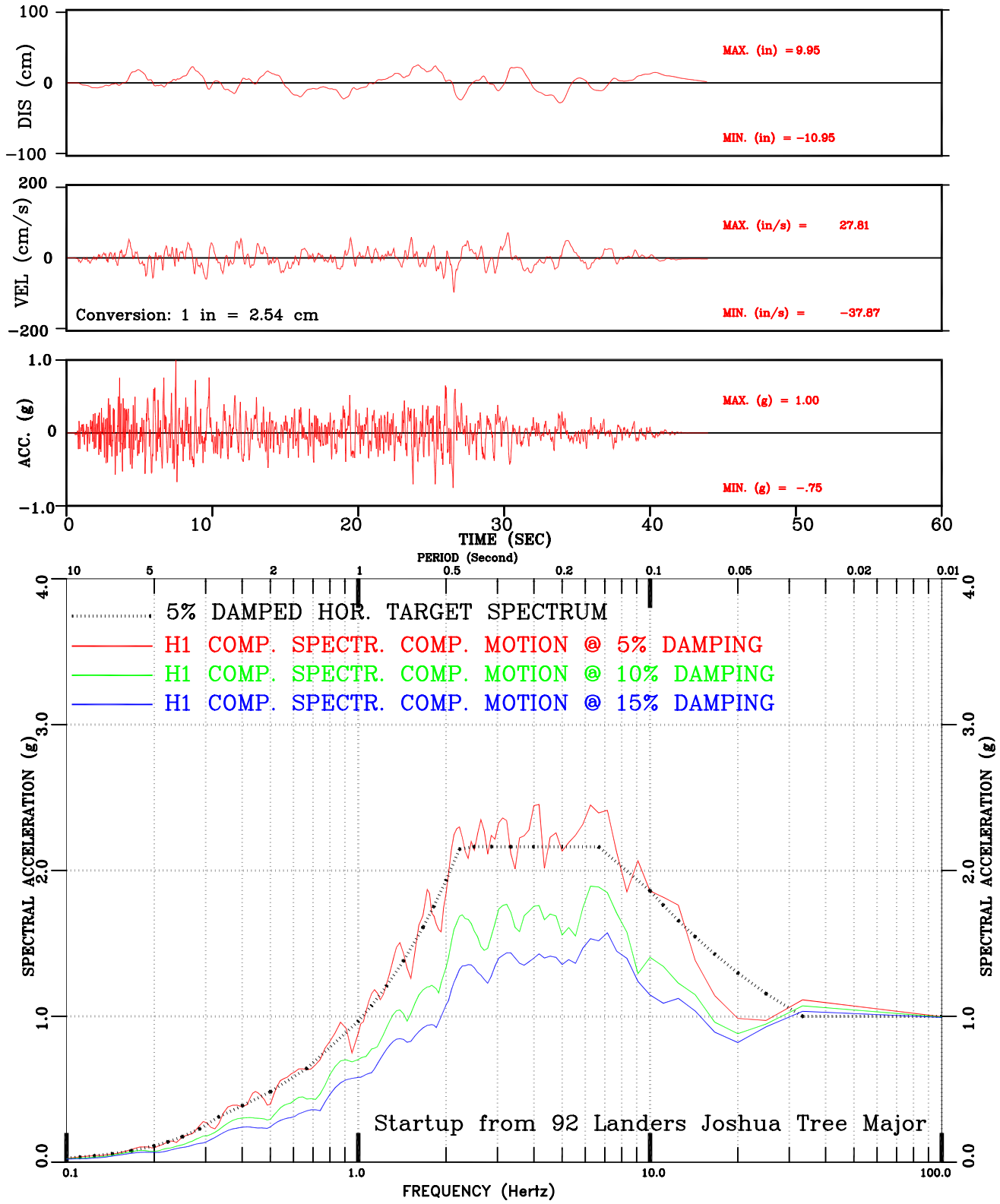


Figure III-25: Set-3 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

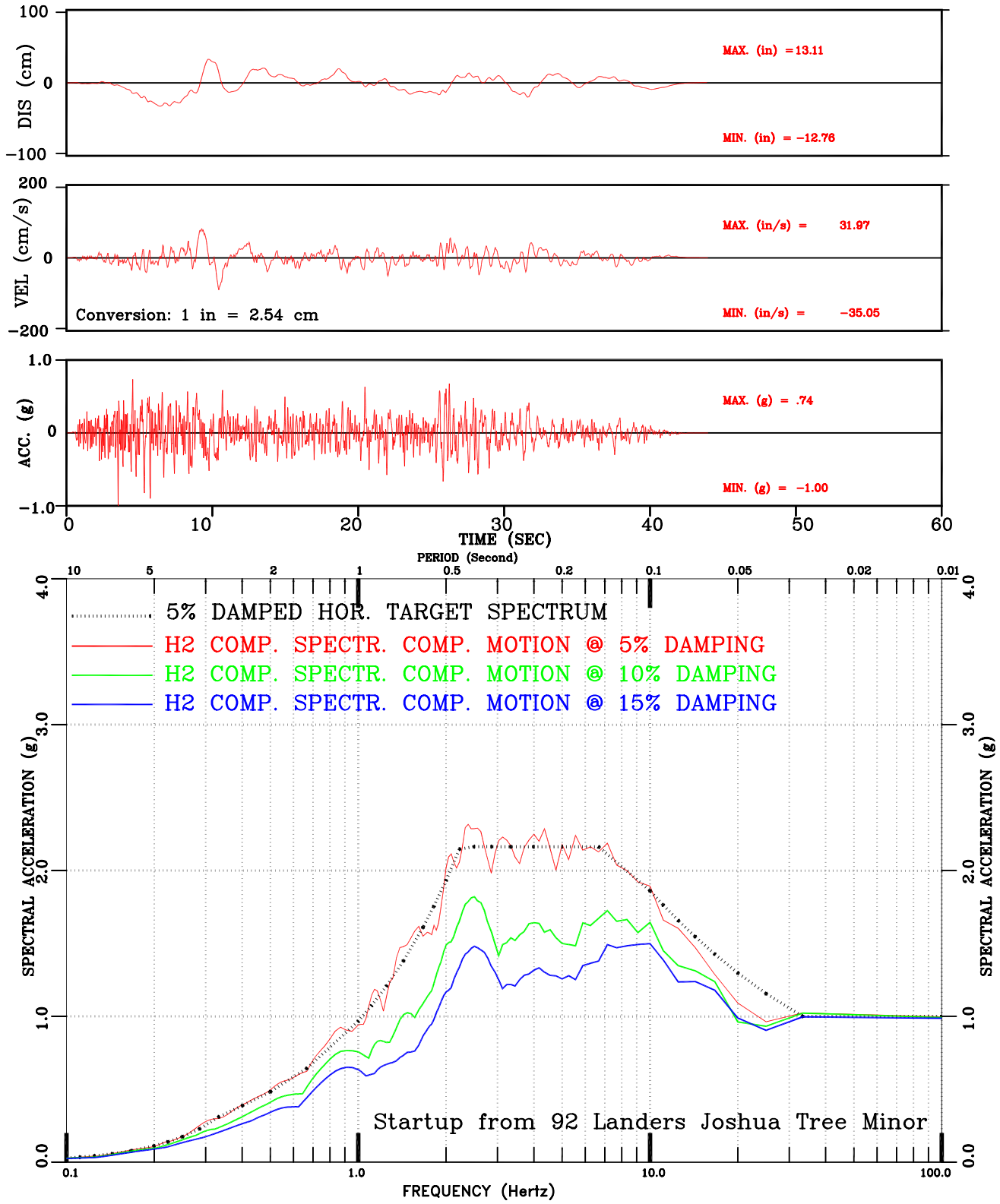


Figure III-26: Set-3 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

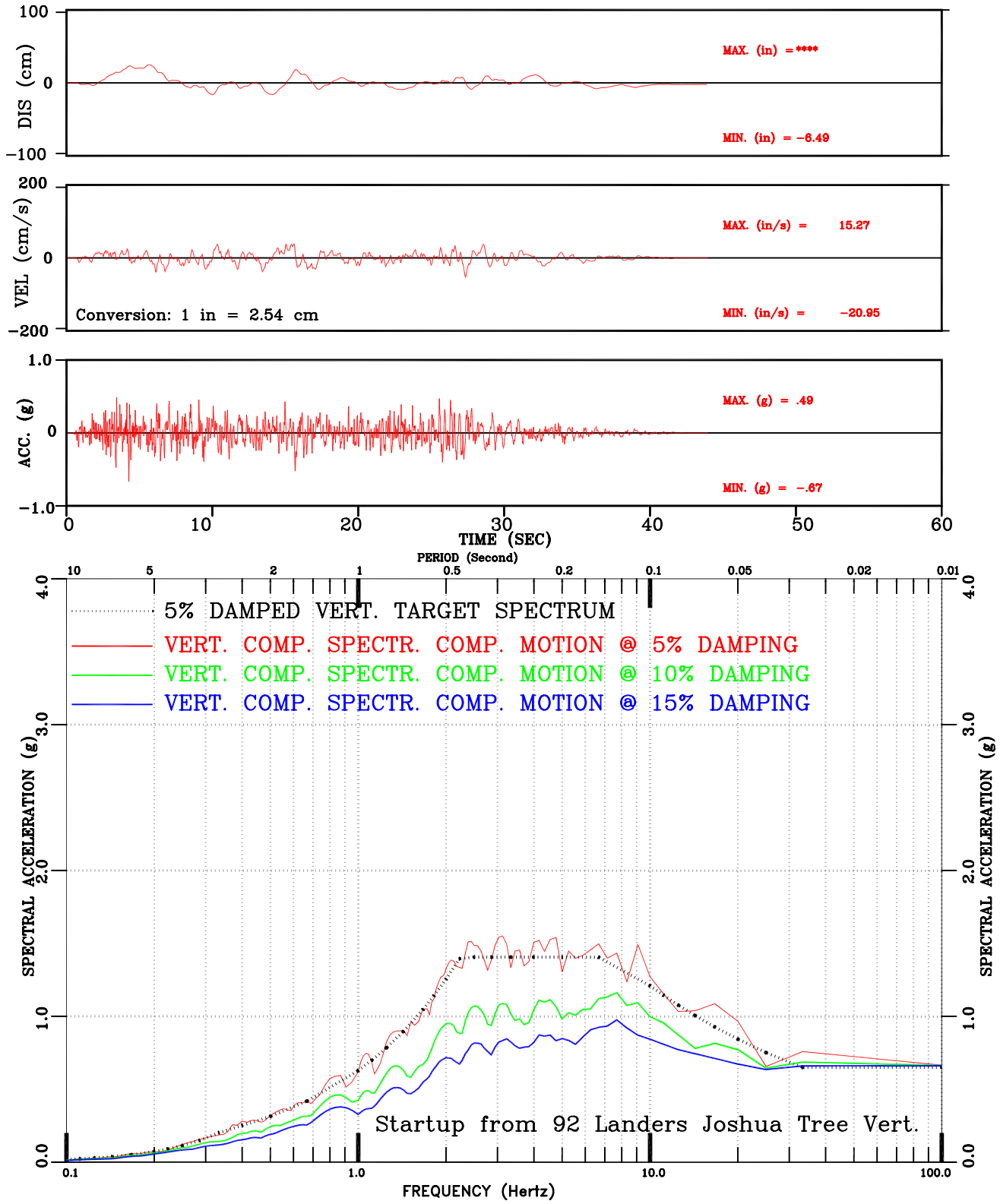


Figure III-27: Set-3 Vert. Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

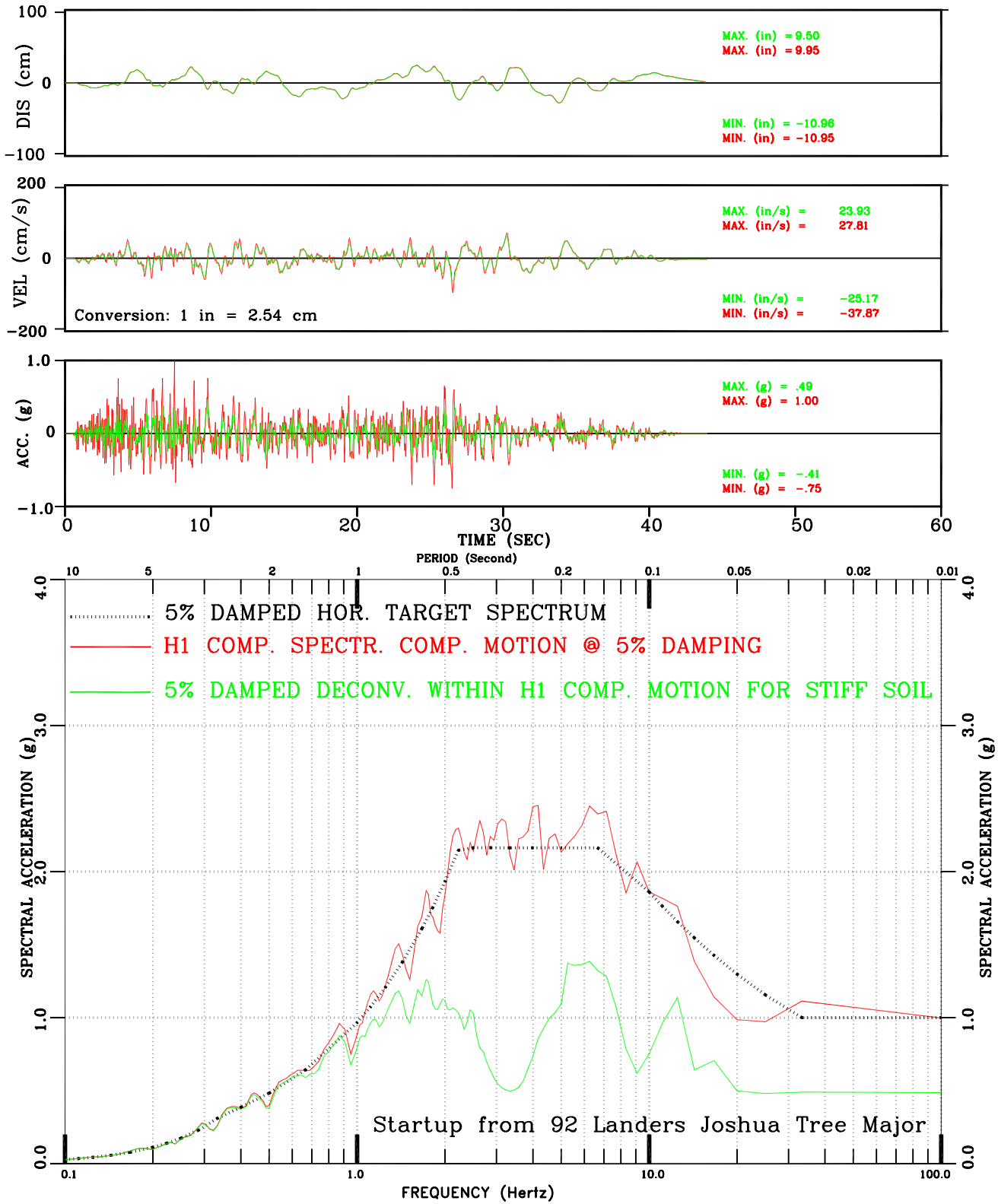


Figure III-28: Deconv. Within vs. Surface Motion for Stiff Soil Set-3 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

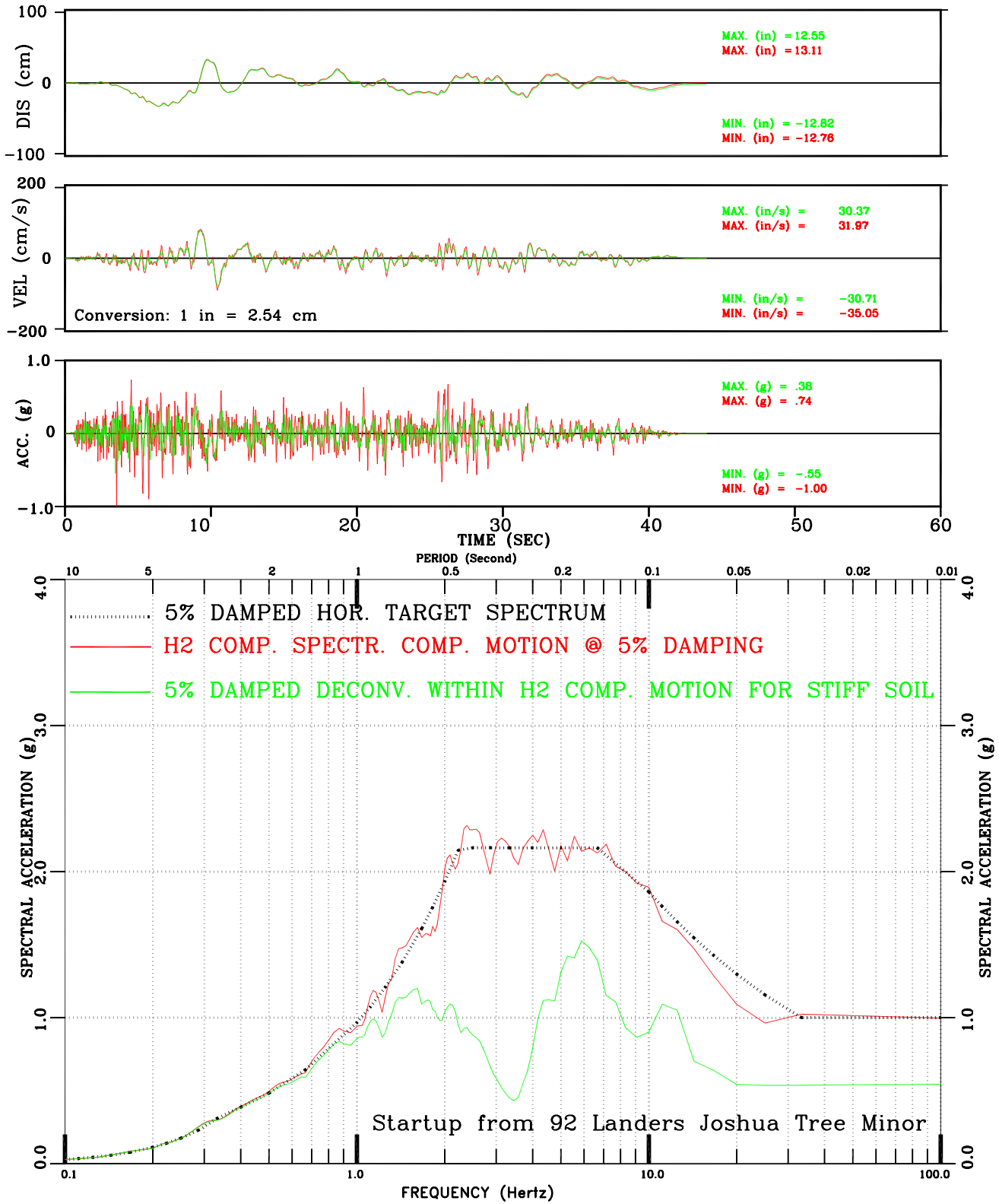


Figure III-29: Deconv. Within vs. Surface Motion for Stiff Soil  
Set-3 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



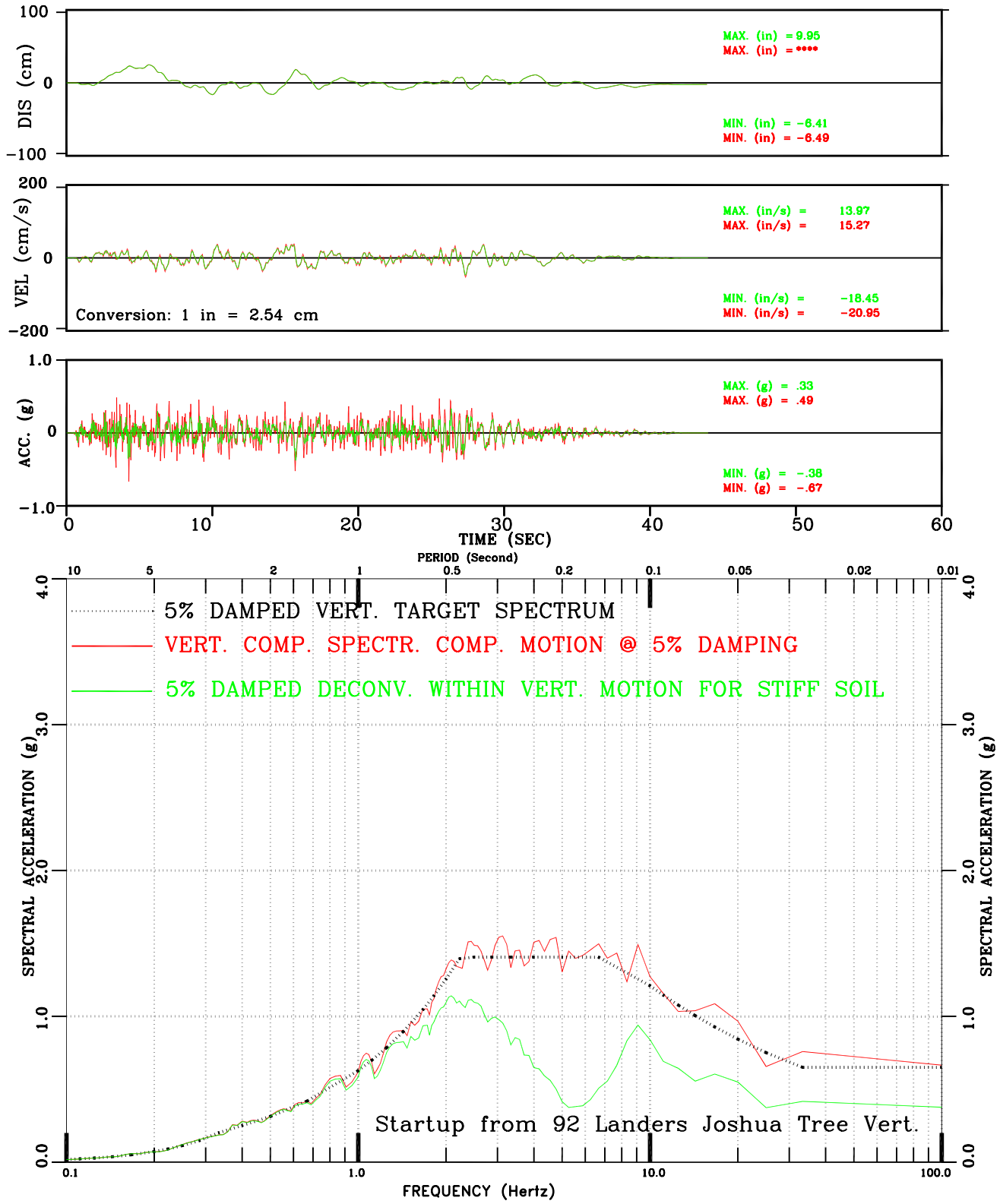


Figure III-30: Deconv. Within vs. Surface Motion for Stiff Soil Set-3 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

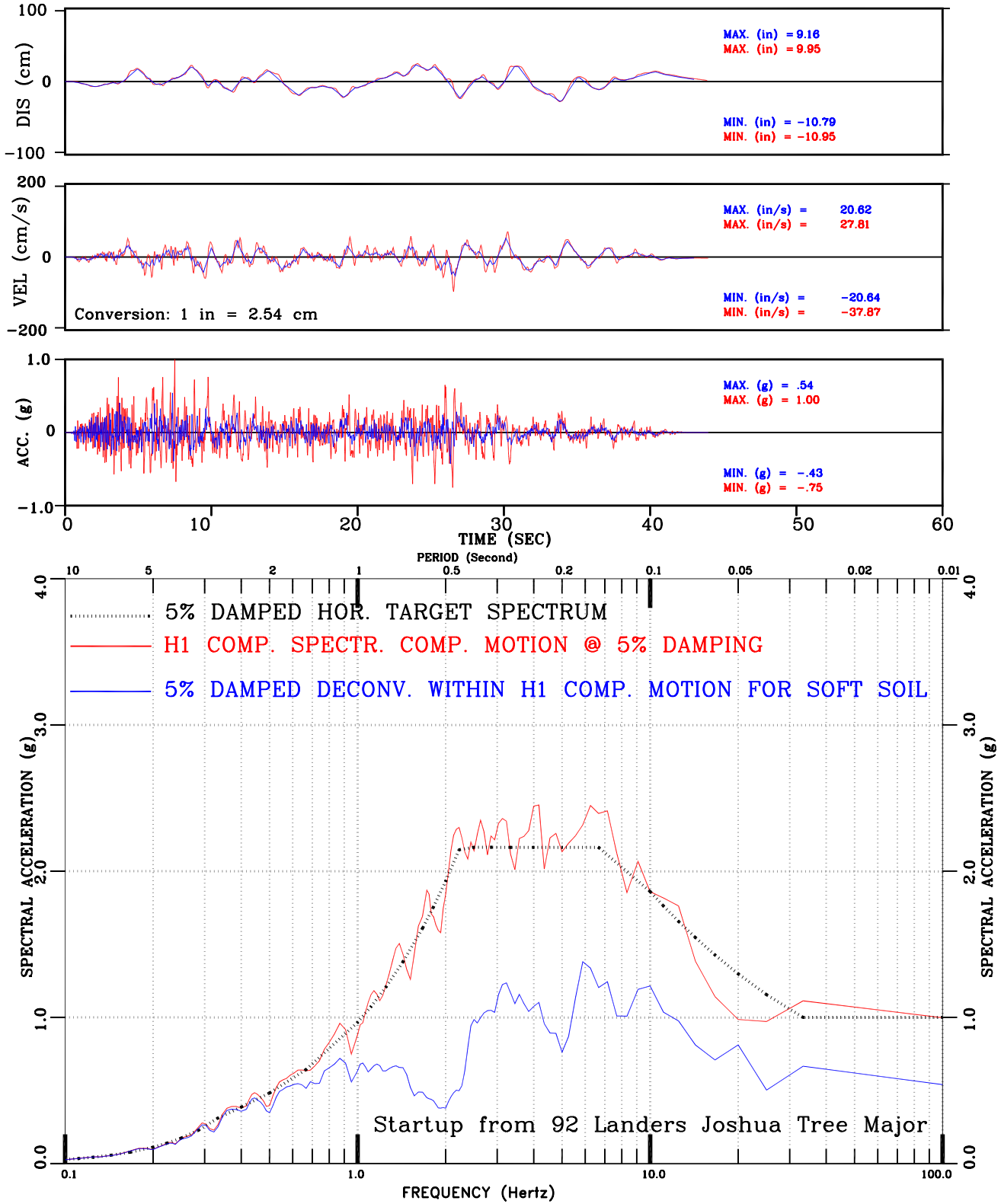


Figure III-31: Deconv. Within vs. Surface Motion for Soft Soil Set-3 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

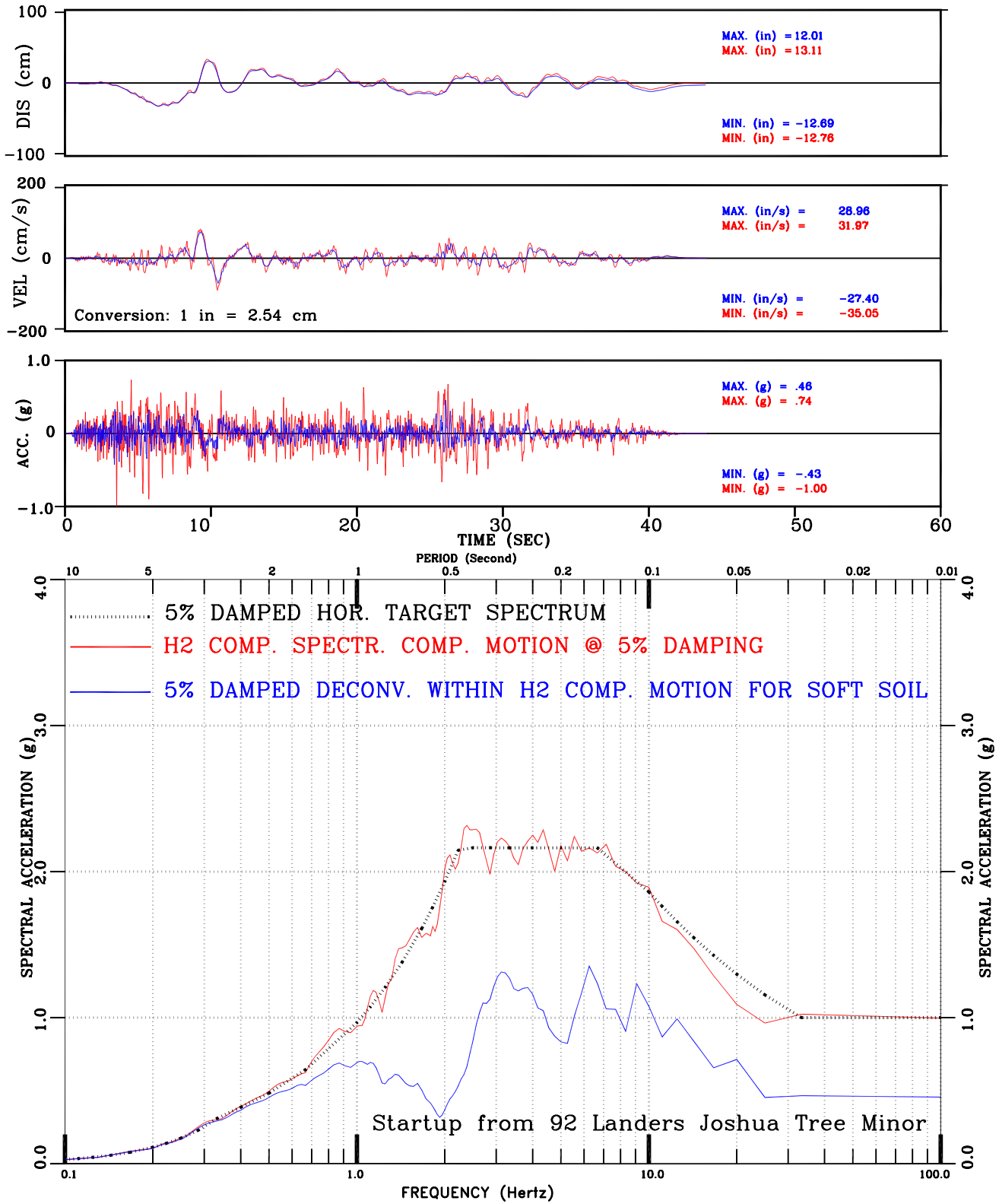


Figure III-32: Deconv. Within vs. Surface Motion for Soft Soil Set-3 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

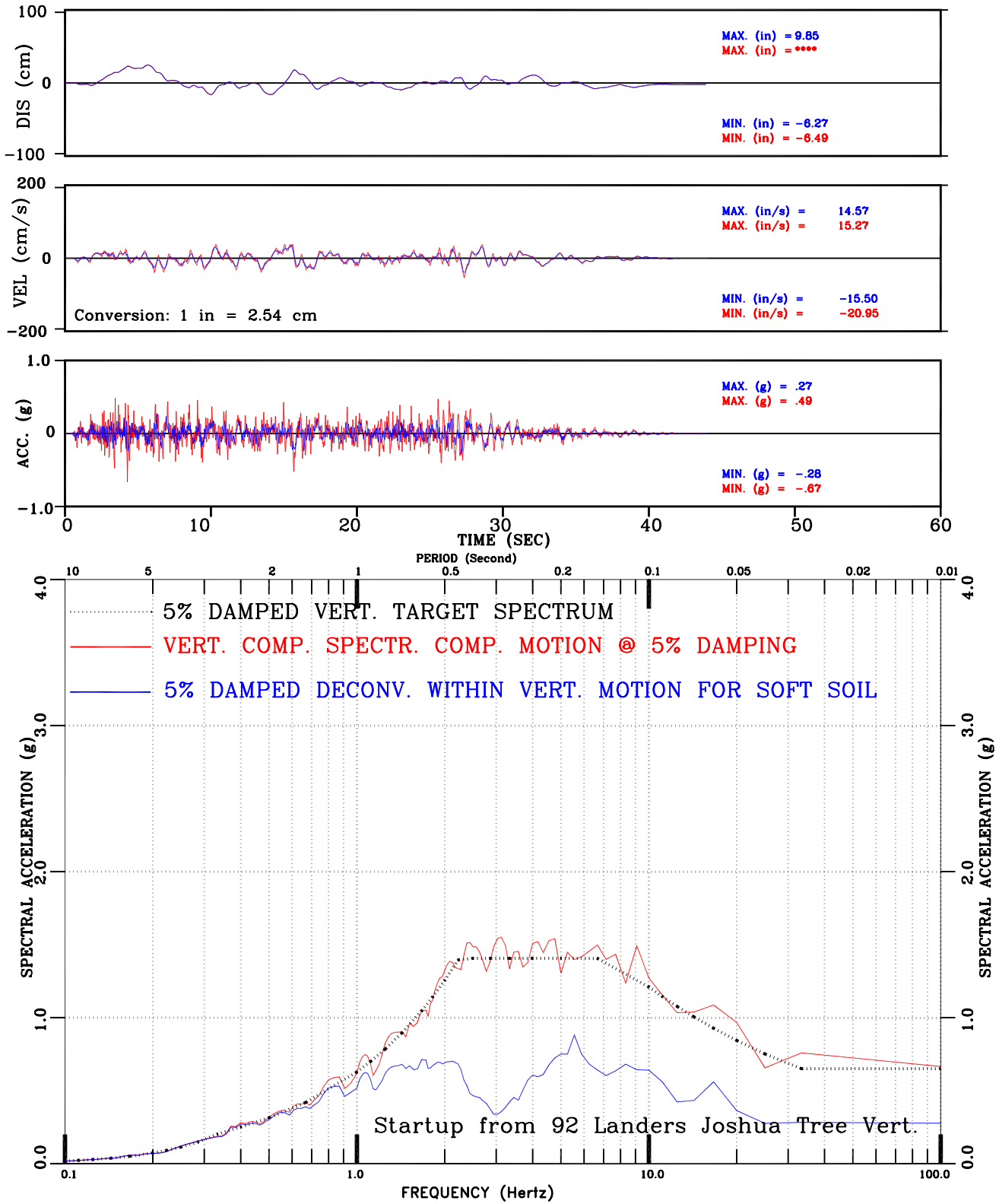


Figure III-33: Deconv. Within vs. Surface Motion for Soft Soil Set-3 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

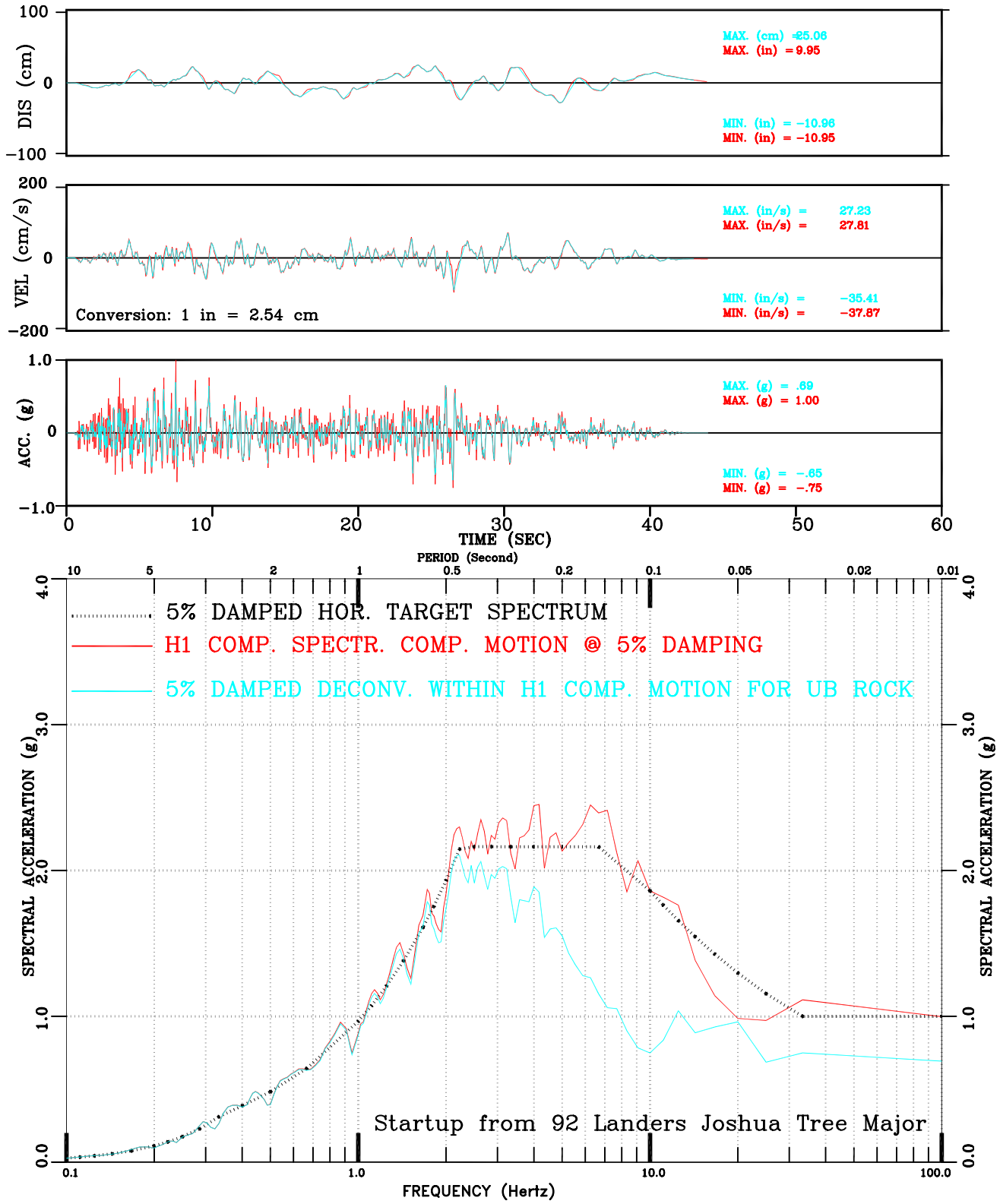


Figure III-34: Deconv. Within vs. Surface Motion for UB Rock Set-3 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

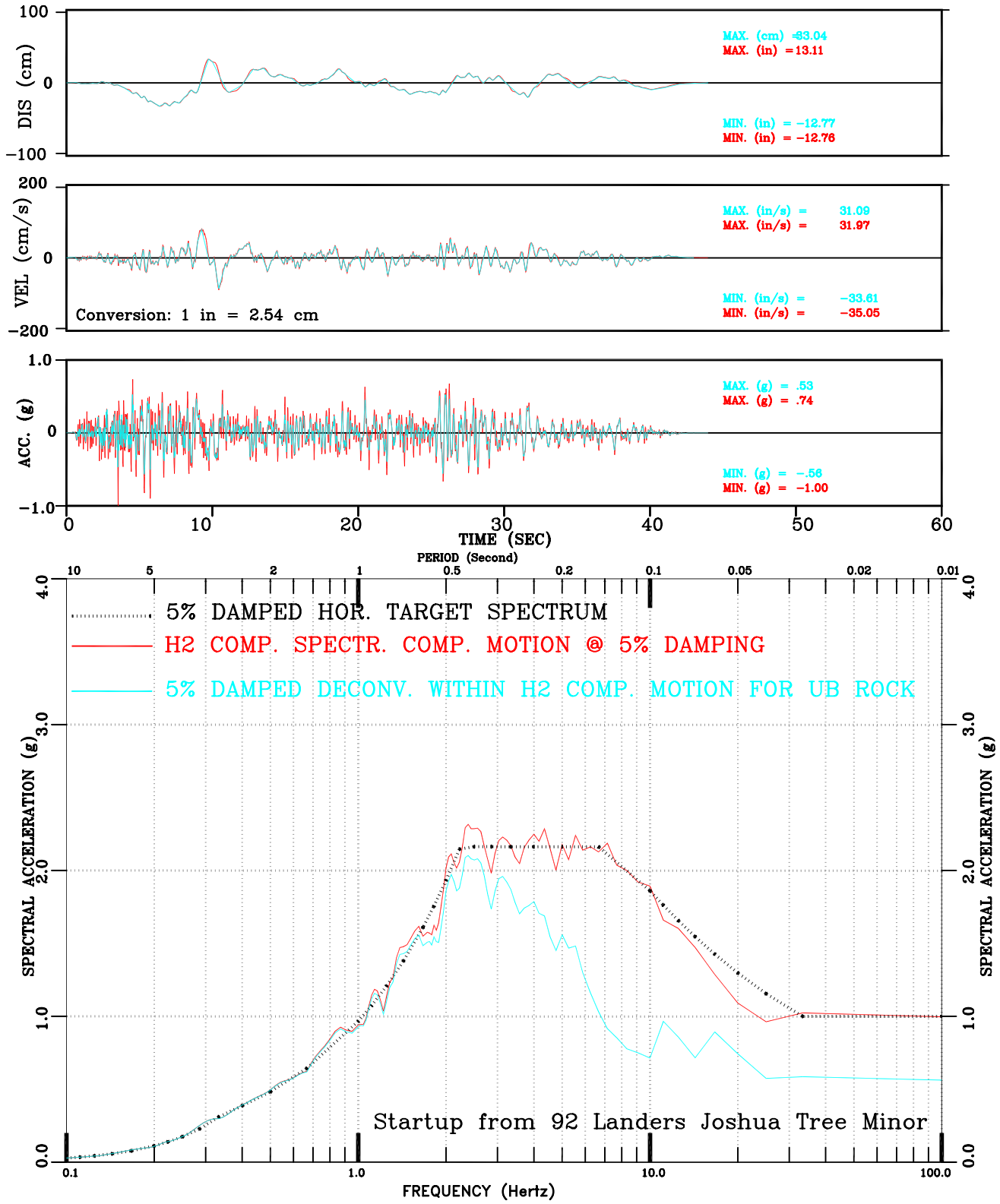


Figure III-35: Deconv. Within vs. Surface Motion for UB Rock Set-3 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

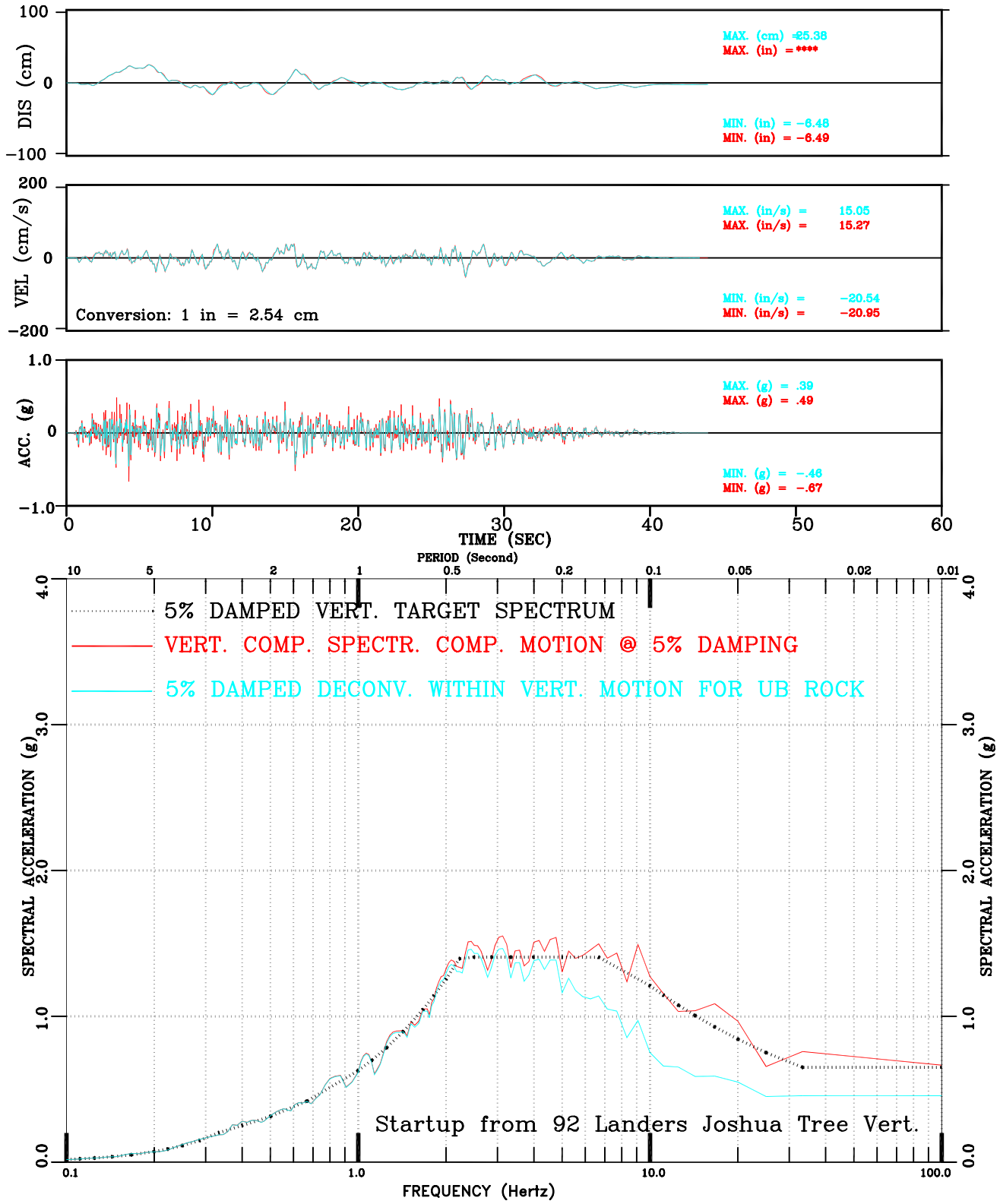


Figure III-36: Deconv. Within vs. Surface Motion for UB Rock Set-3 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

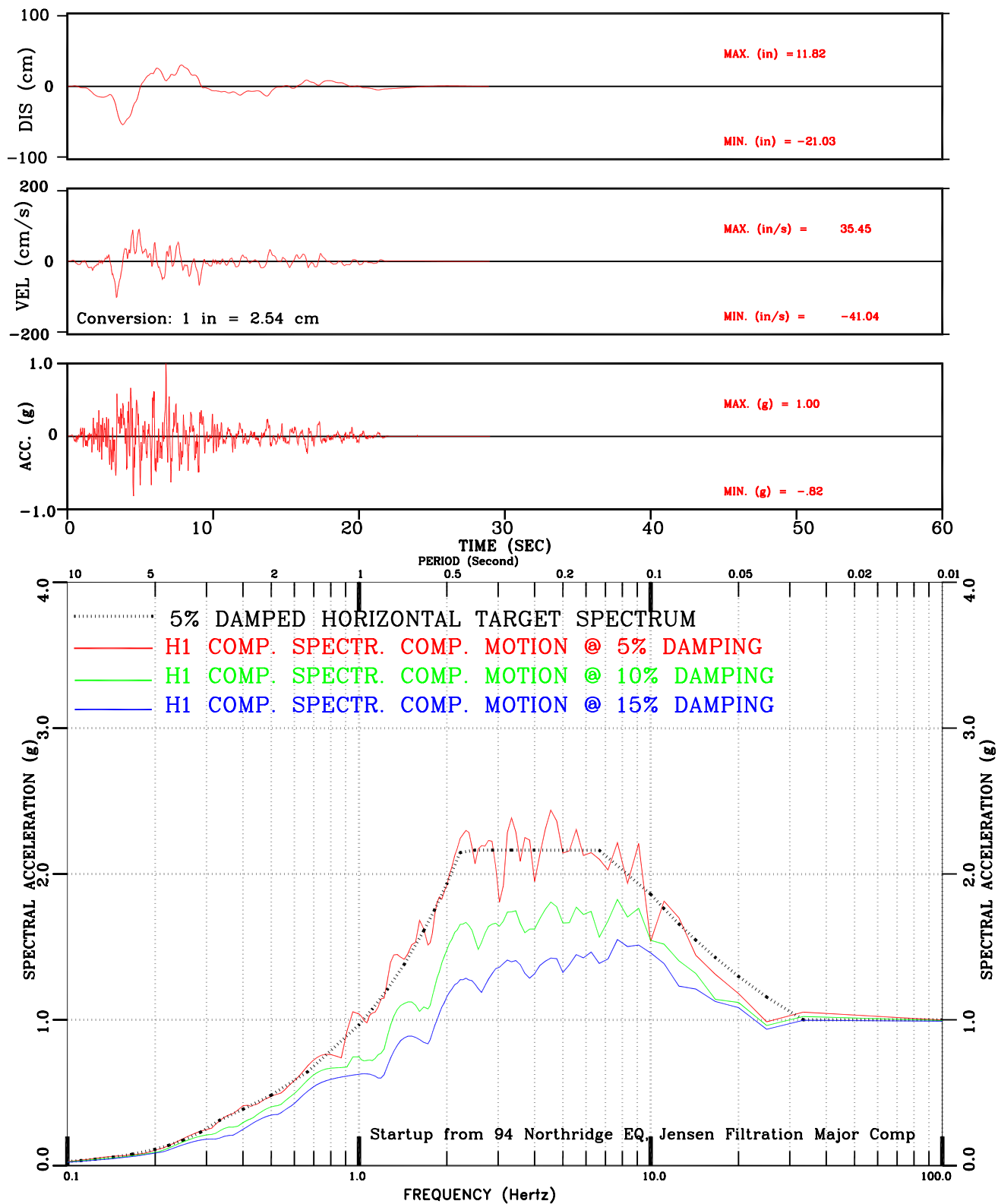


Figure III-37: Set-4 H1 Comp Motion Conforming to NUREG/CR-0098 Spectral Shape



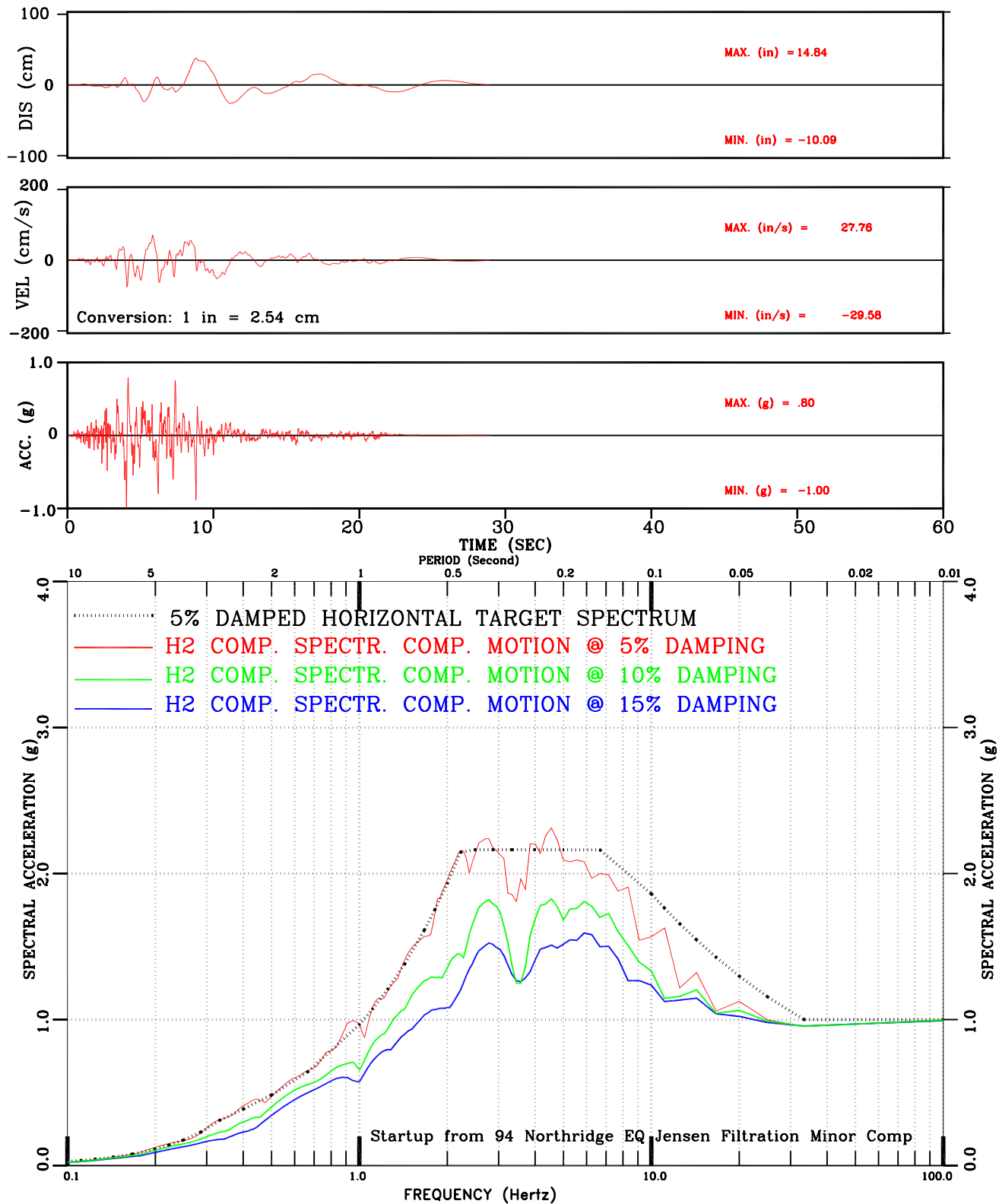


Figure III-38: Set-4 H2 Comp Motion Conforming to NUREG/CR-0098 Spectral Shape

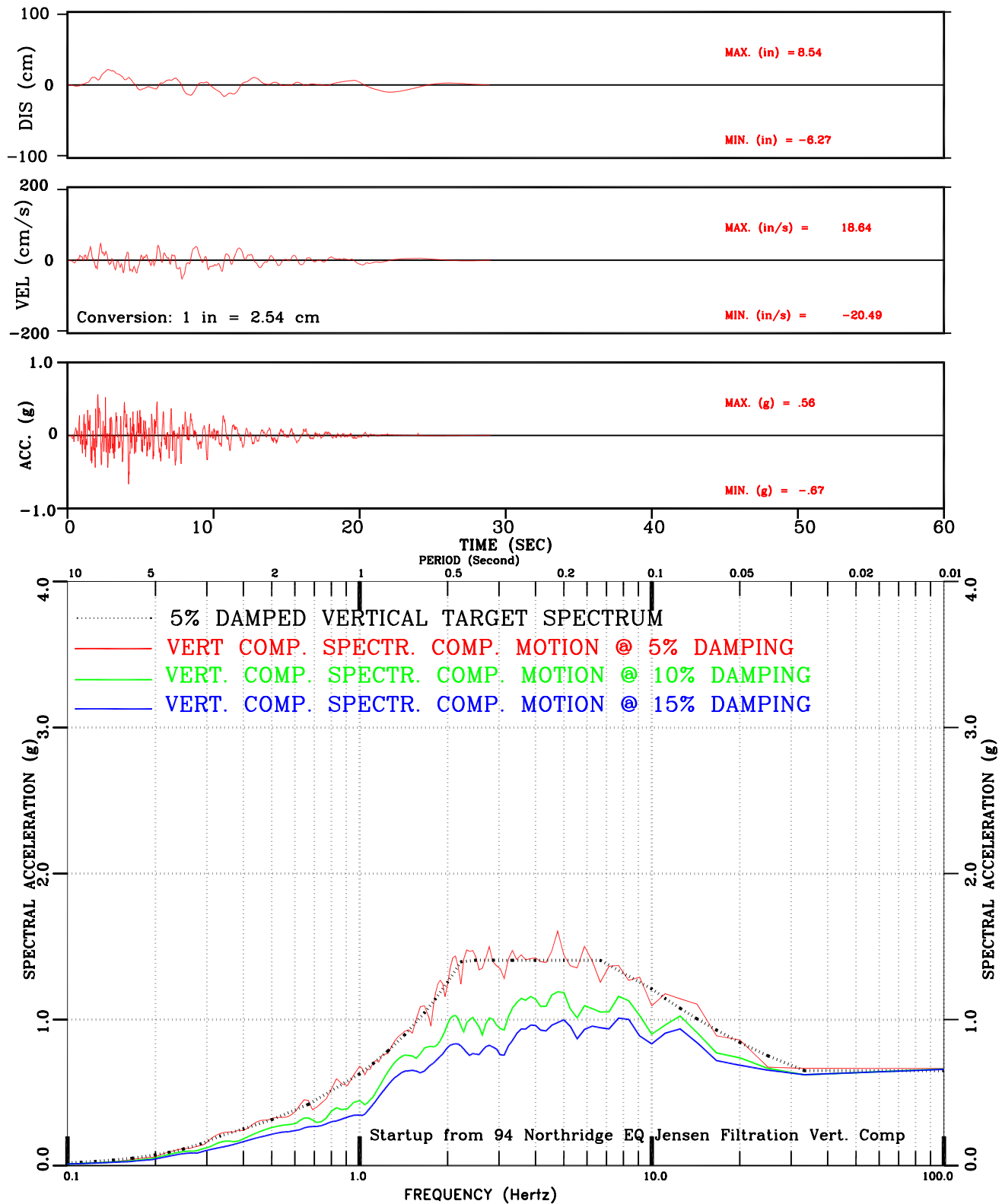


Figure III-39: Set-4 Vert Comp Motion Conforming to NUREG/CR-0098 Spectral Shape

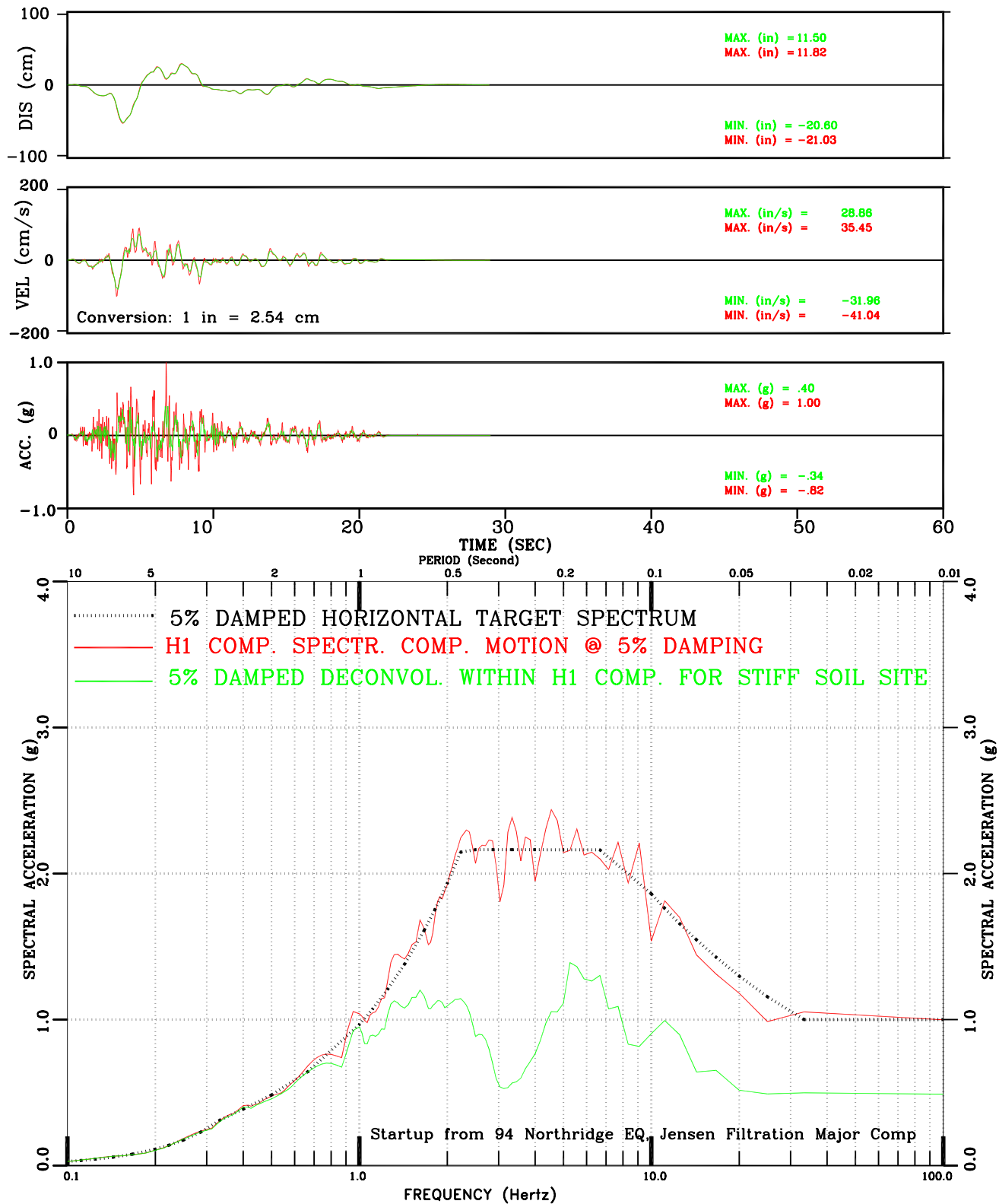


Figure III-40: Deconvolved Within vs. Surface Motion for Stiff Soil Set-4 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

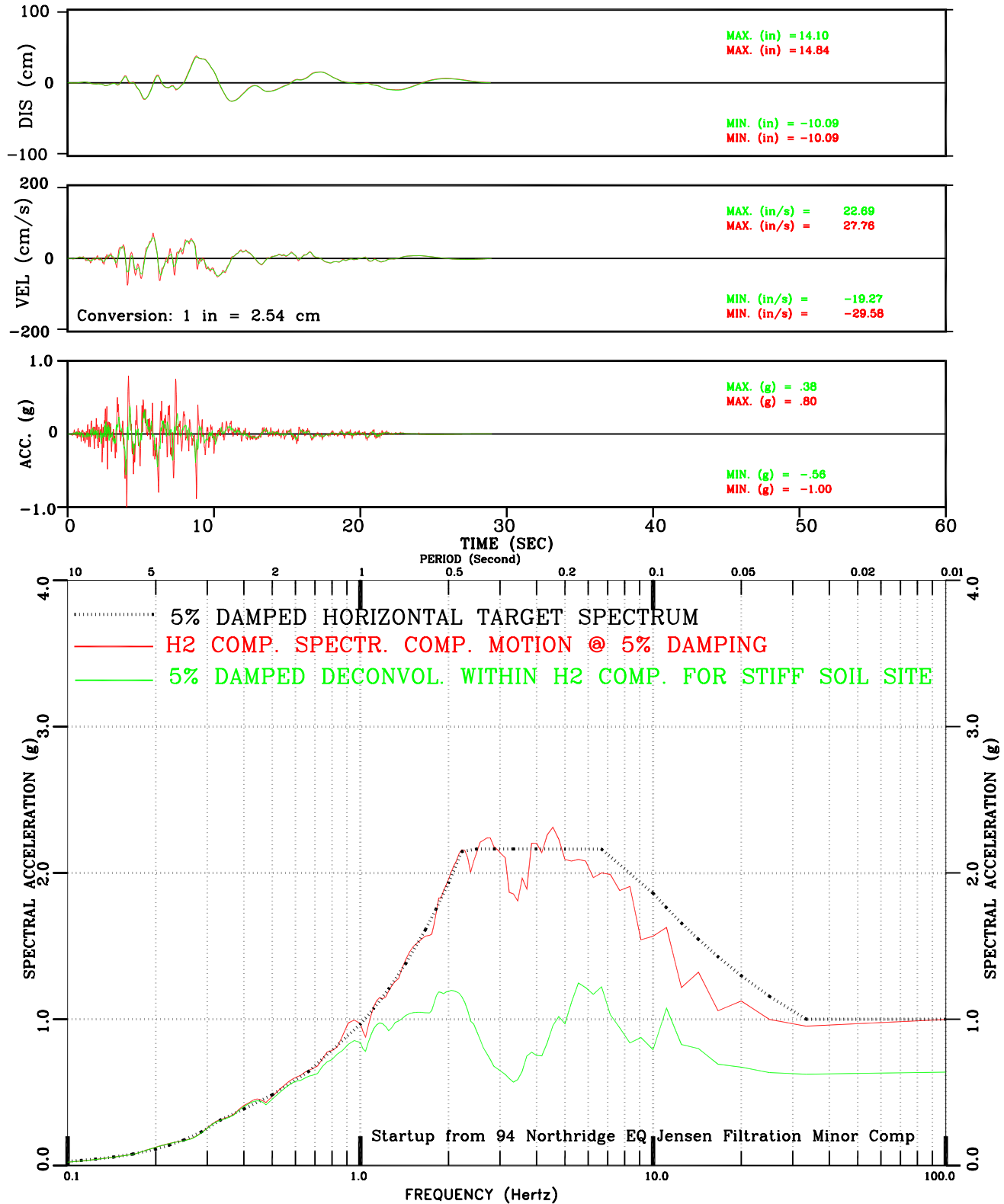


Figure III-41: Deconvolved Within vs. Surface Motion for Stiff Soil Set-4 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

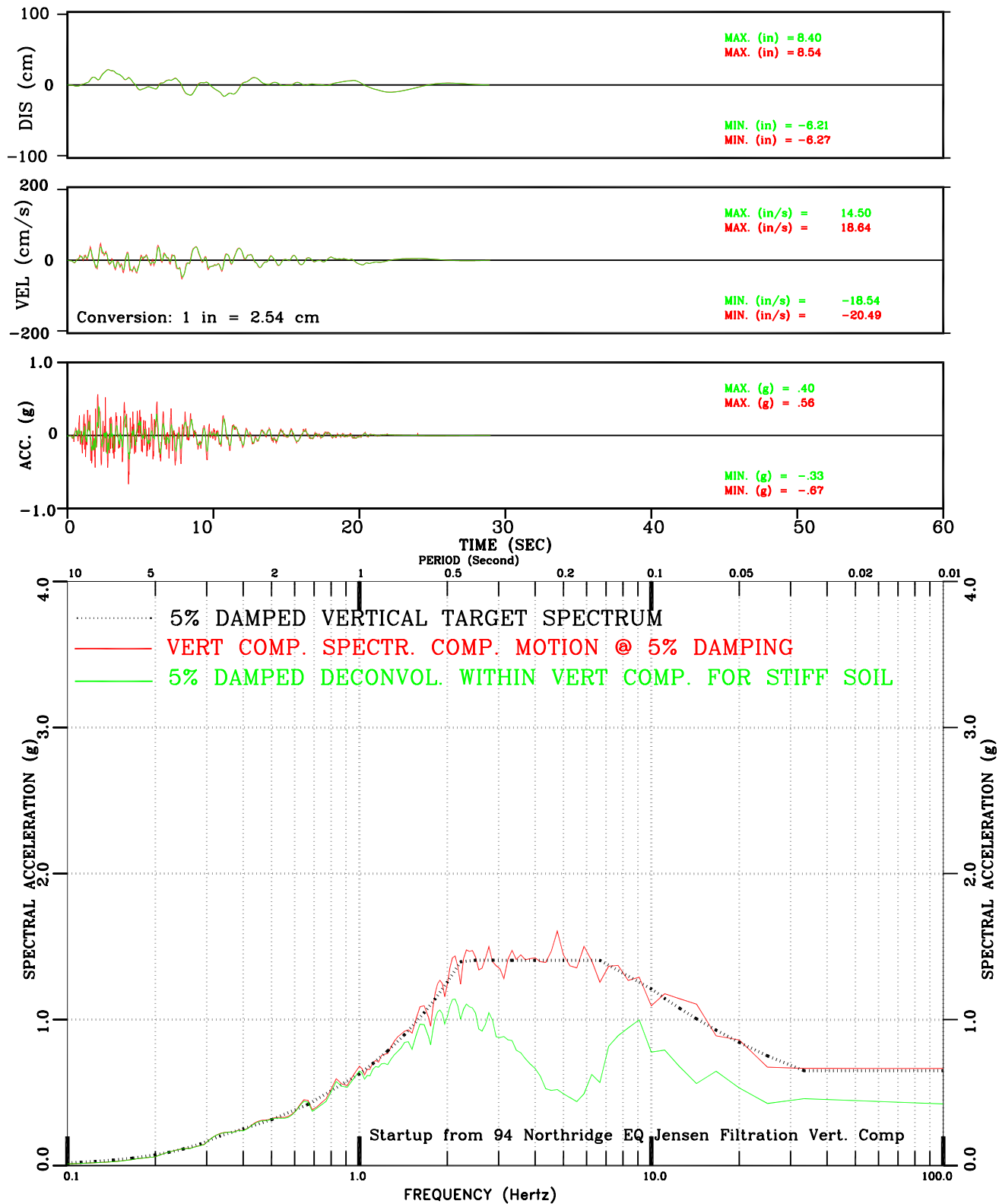


Figure III-42: Deconvolved Within vs. Surface Motion for Stiff Soil Set-4 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

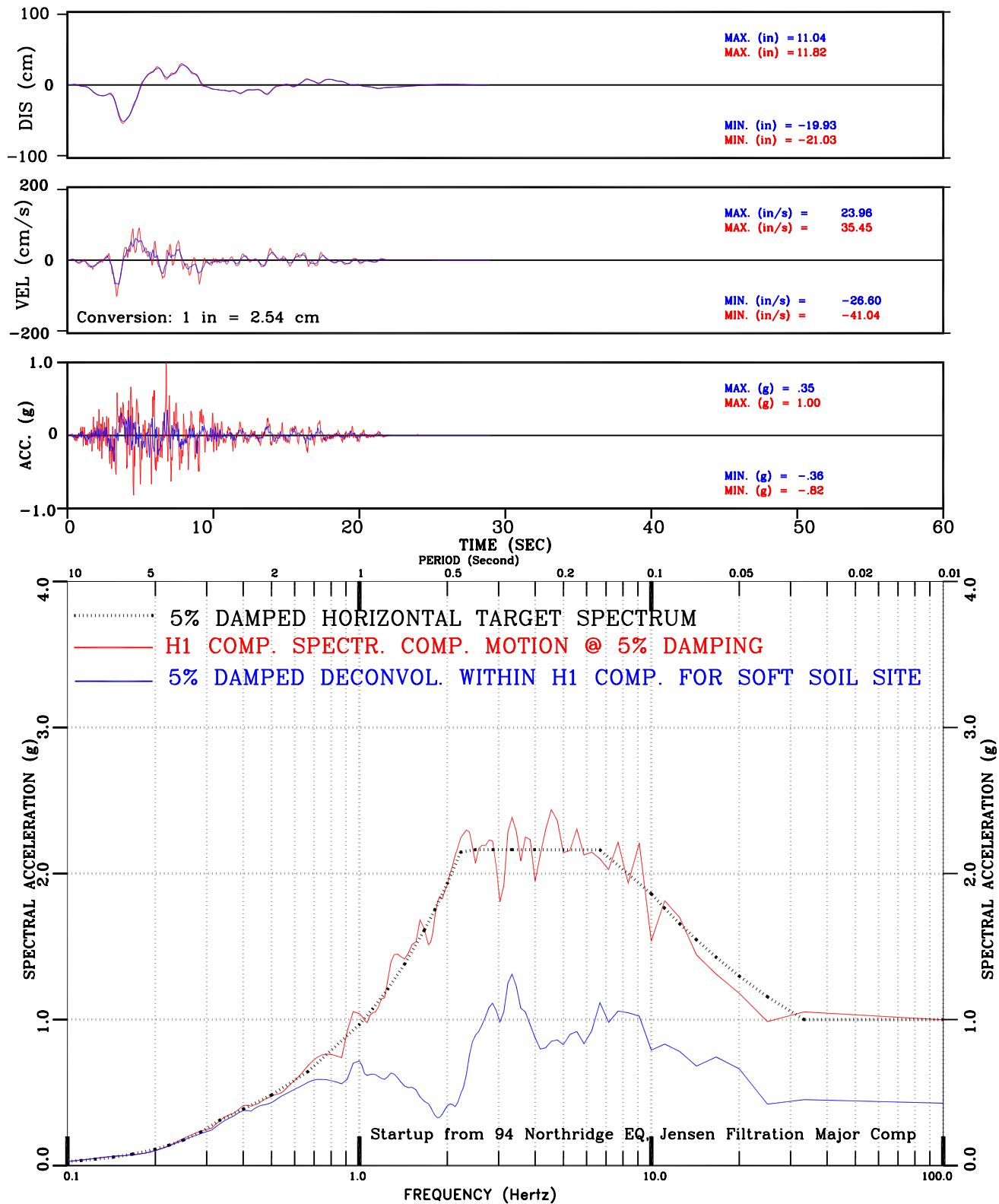


Figure III-43: Deconvolved Within vs. Surface Motion for Soft Soil Set-4 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

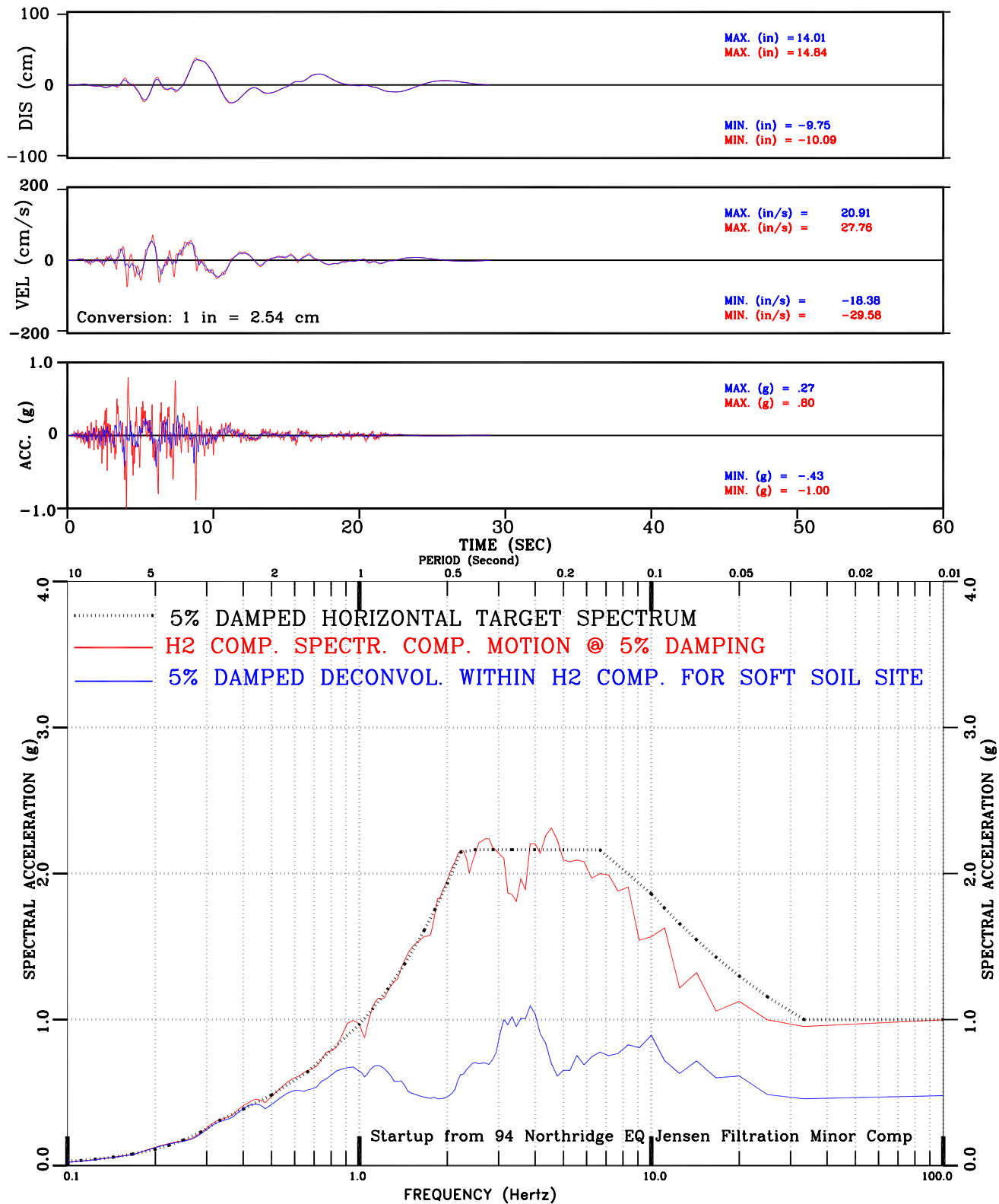


Figure III-44: Deconvolved Within vs. Surface Motion for Soft Soil Set-4 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

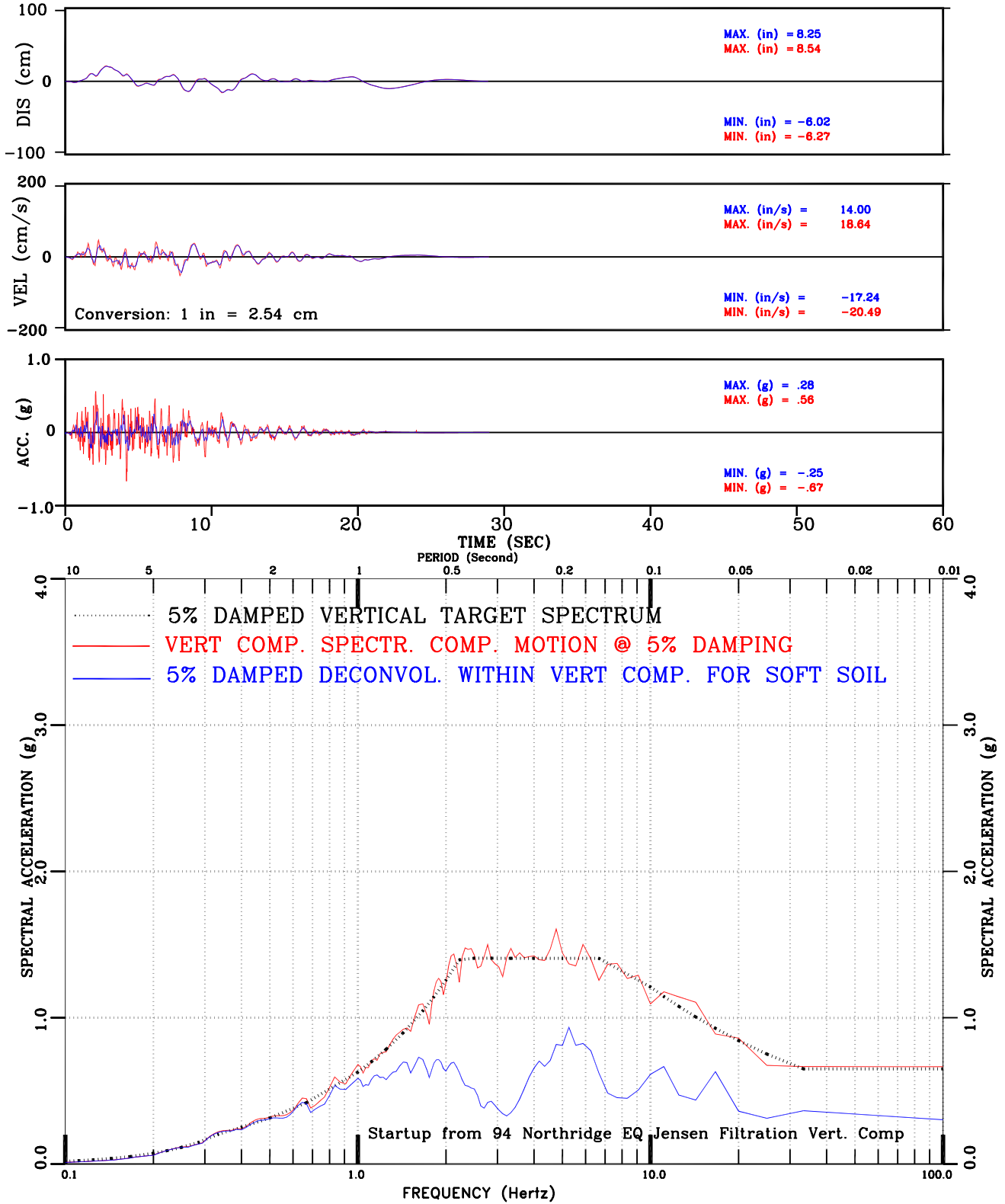


Figure III-45: Deconvolved Within vs. Surface Motion for Soft Soil Set-4 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



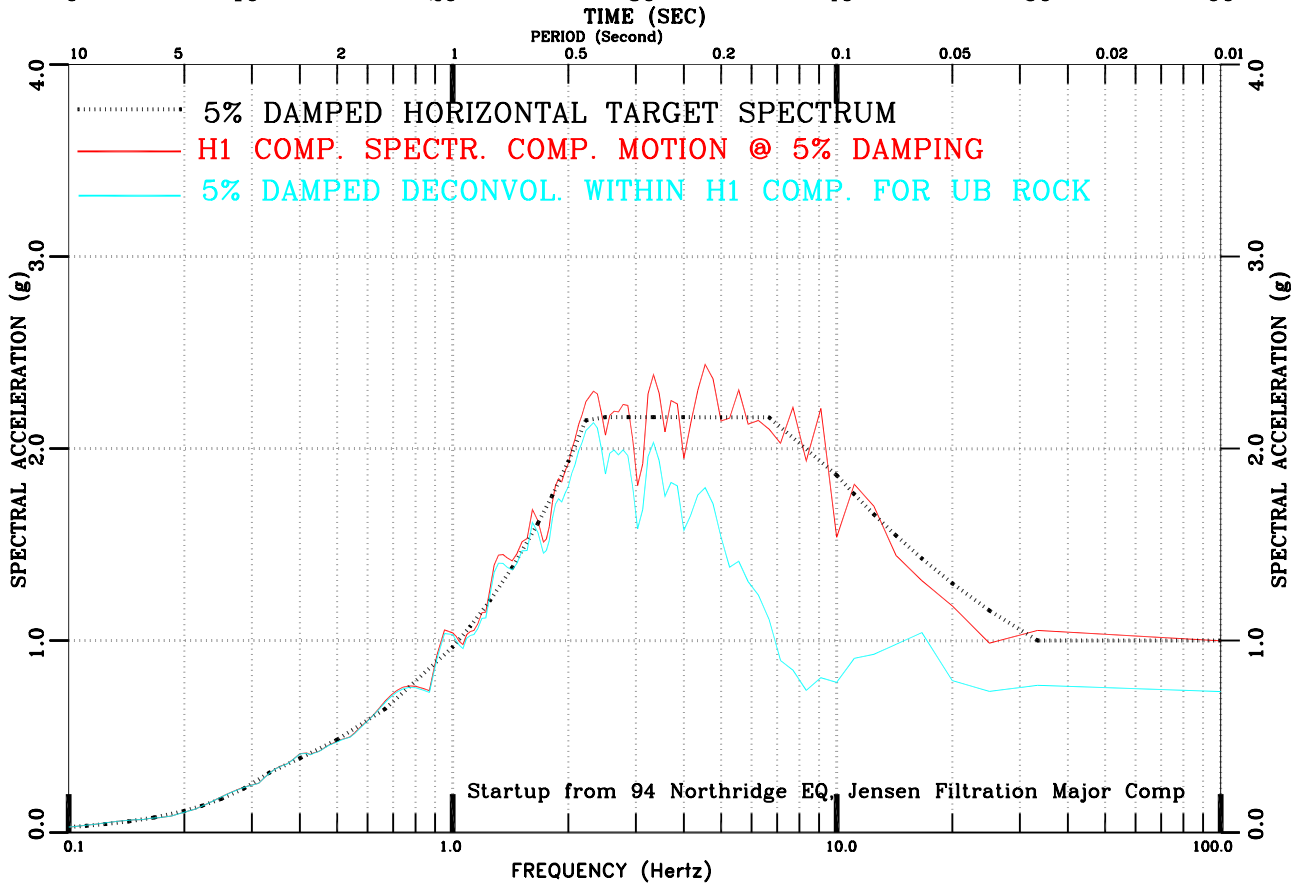
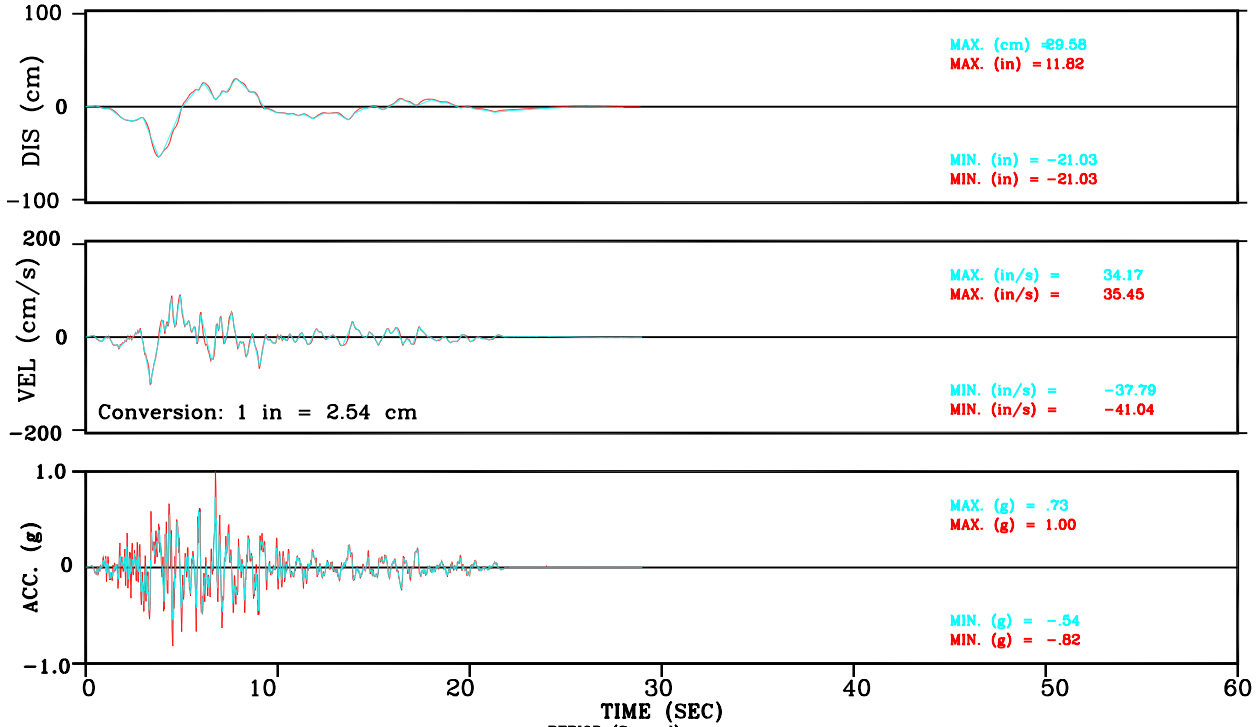


Figure III-46: Deconvolved Within vs. Surface Motion for UB Rock Set-4 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

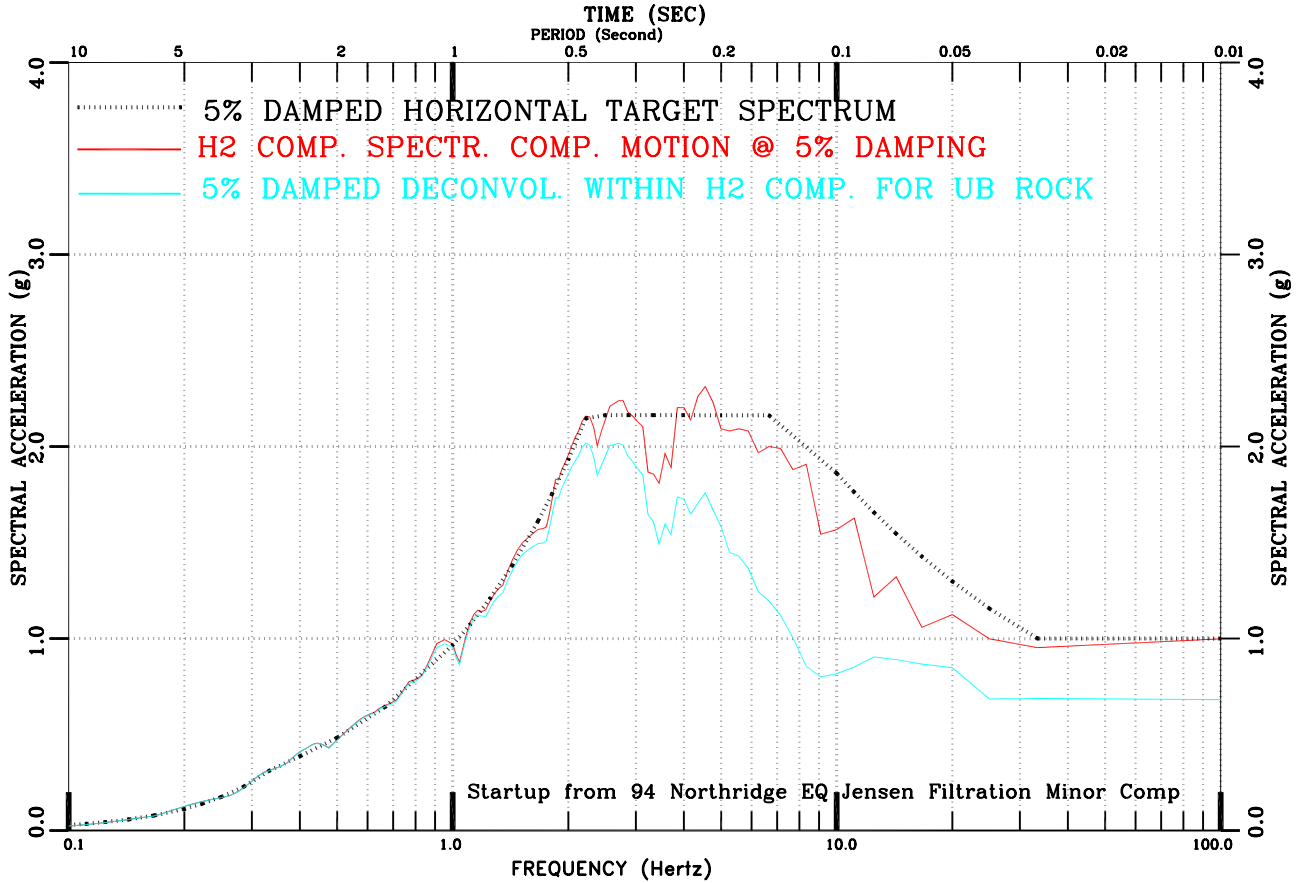
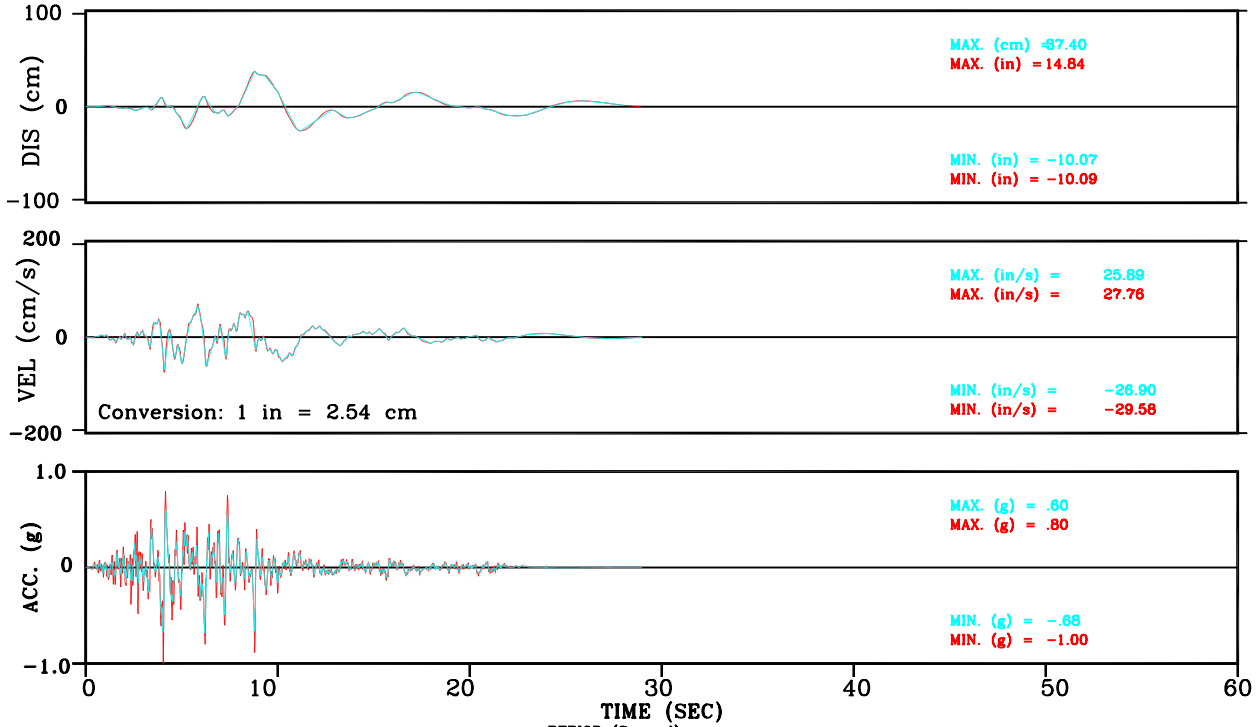


Figure III-47: Deconvolved Within vs. Surface Motion for UB Rock Set-4 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

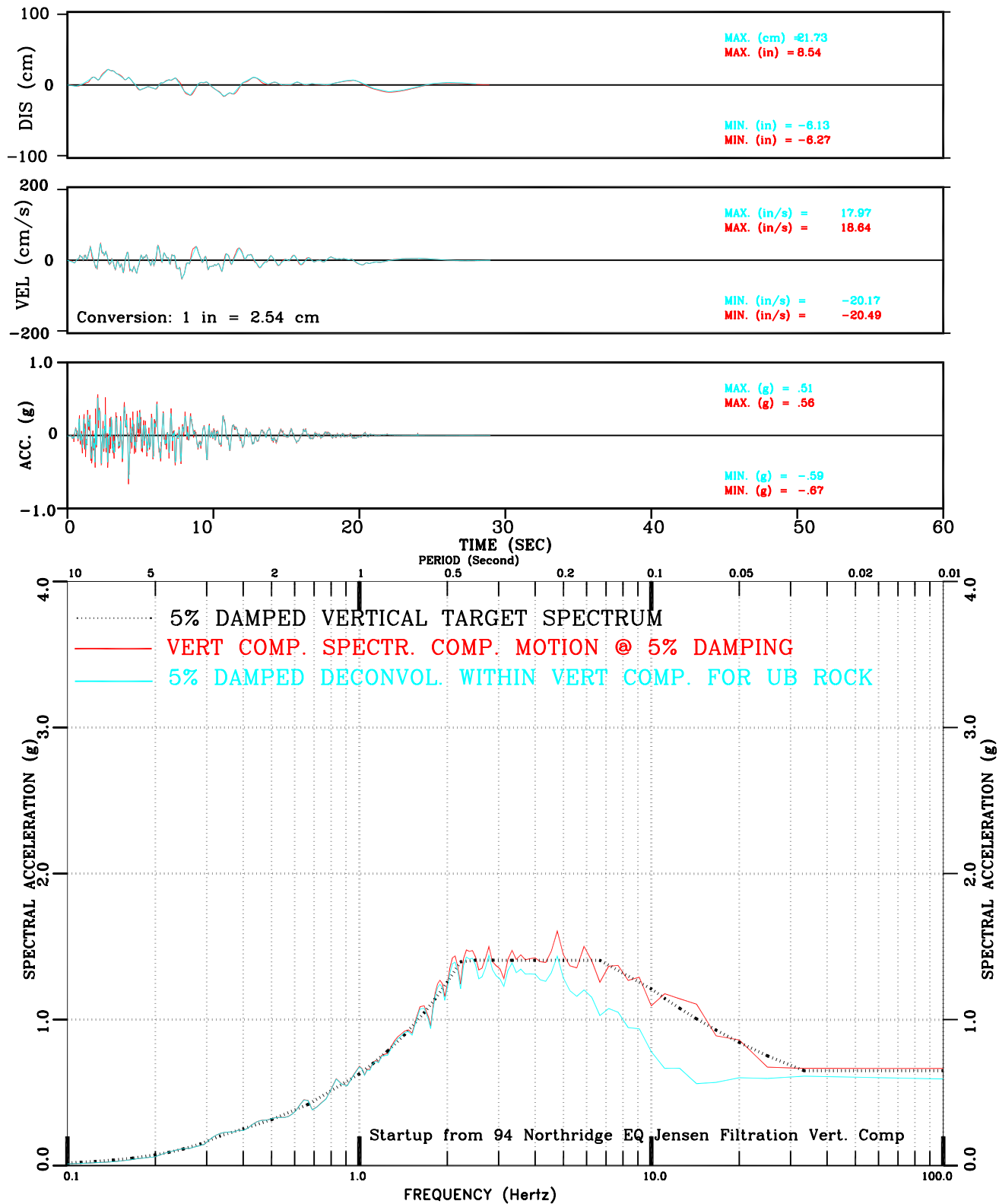


Figure III-48: Deconvolved Within vs. Surface Motion for UB Rock Set-4 Vert Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

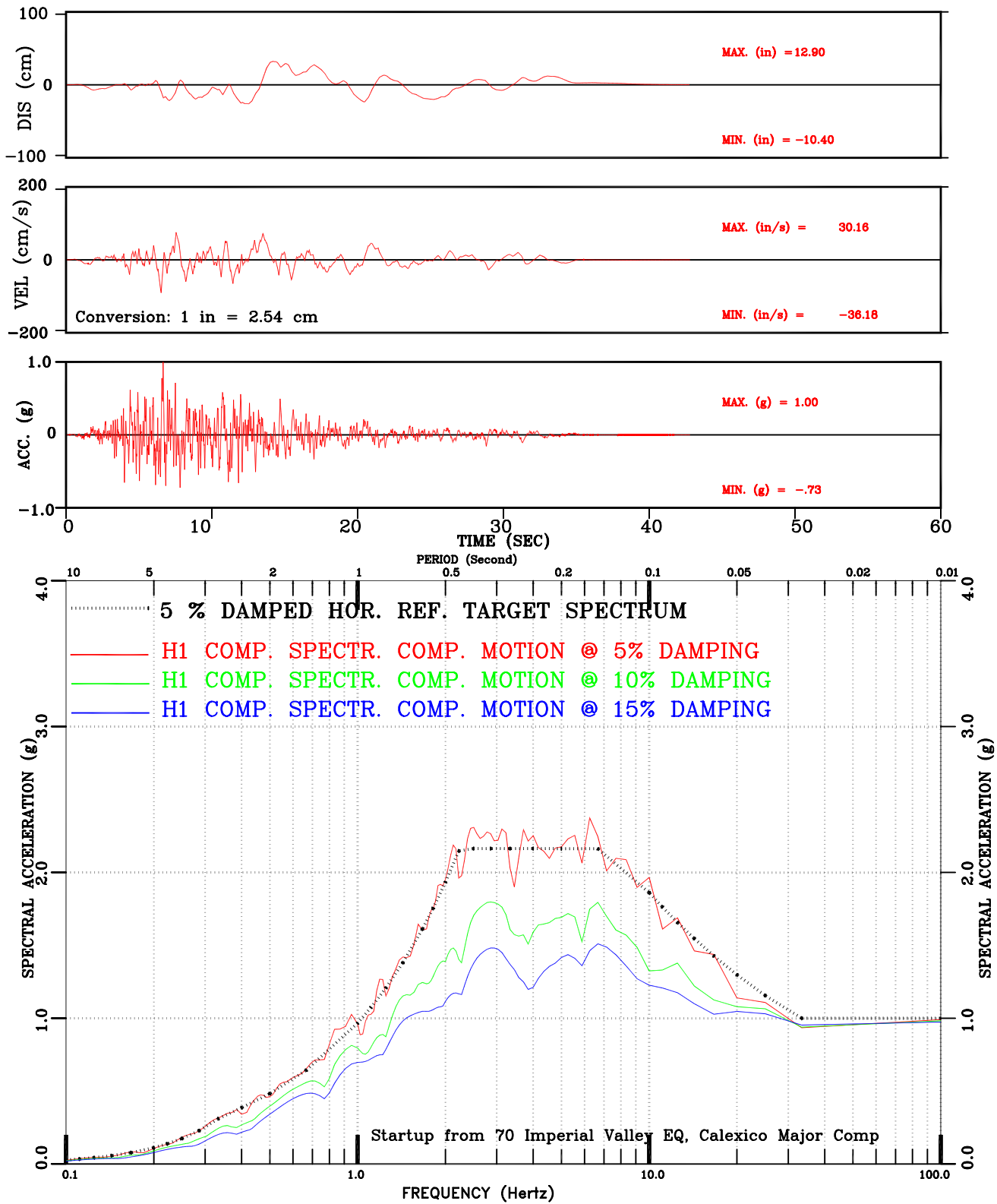


Figure III-49: Set-5 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

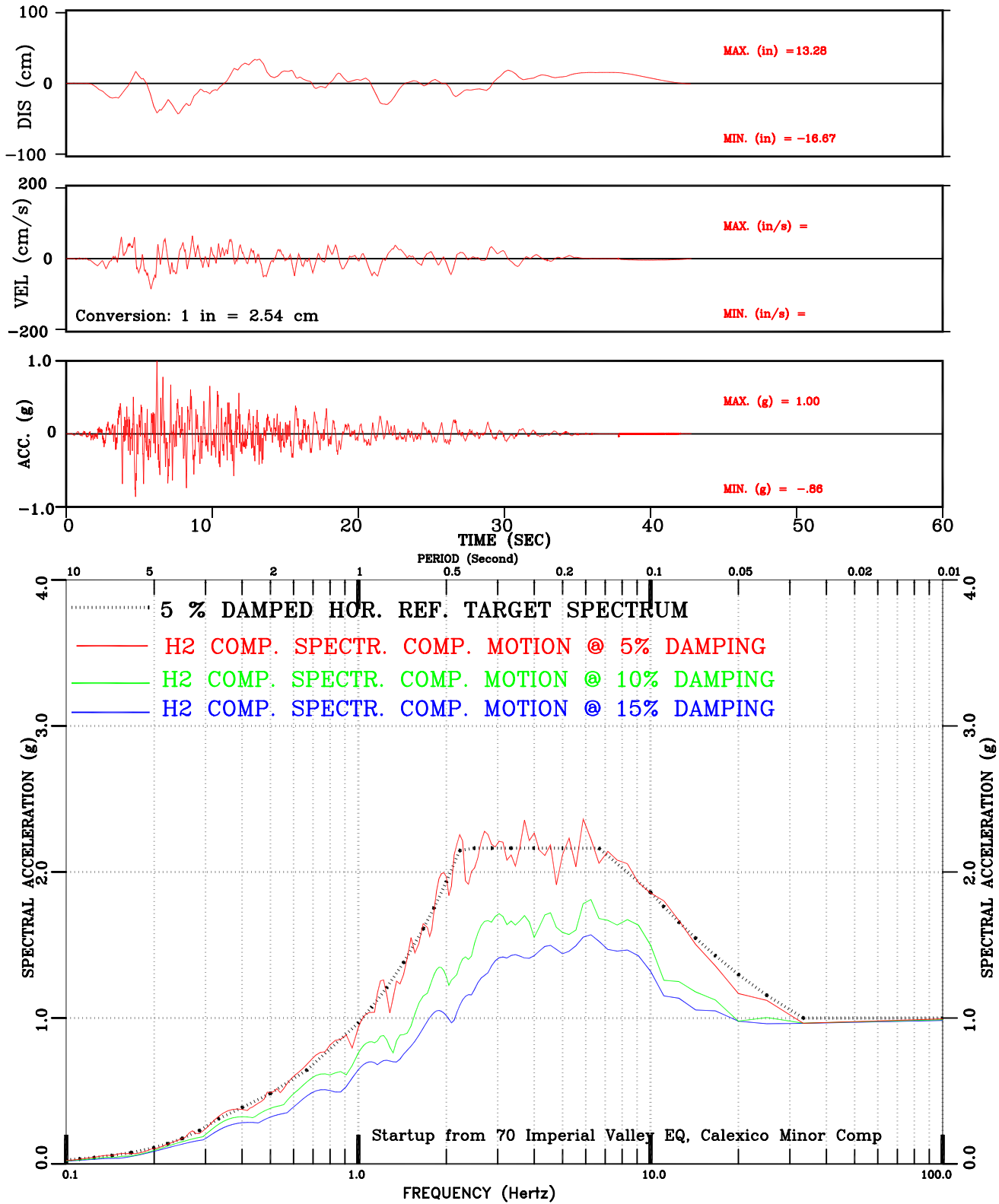


Figure III-50: Set-5 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

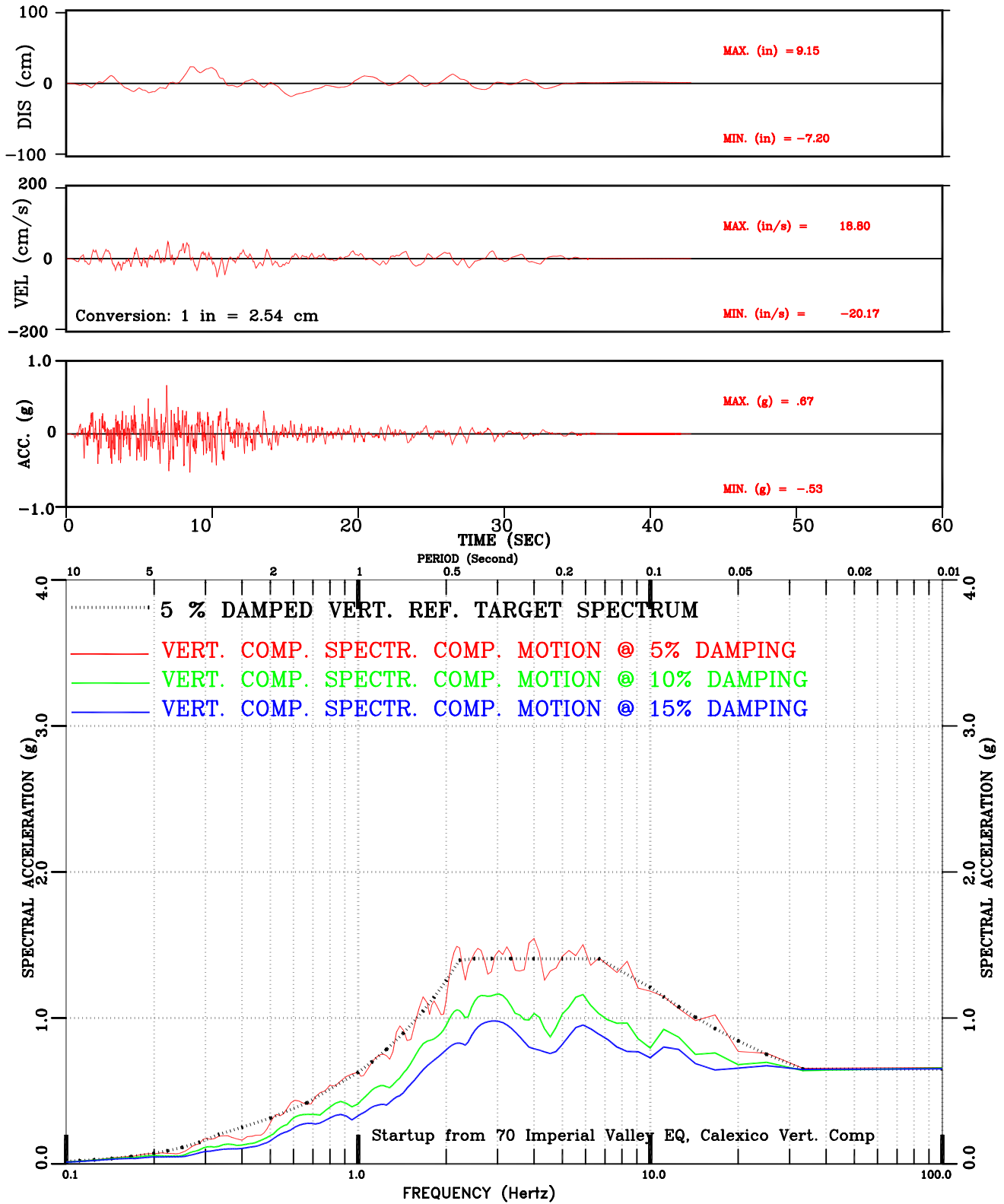


Figure III-51: Set-5 VERT Motion Conforming to NUREG/CR-0098 Spectral Shape

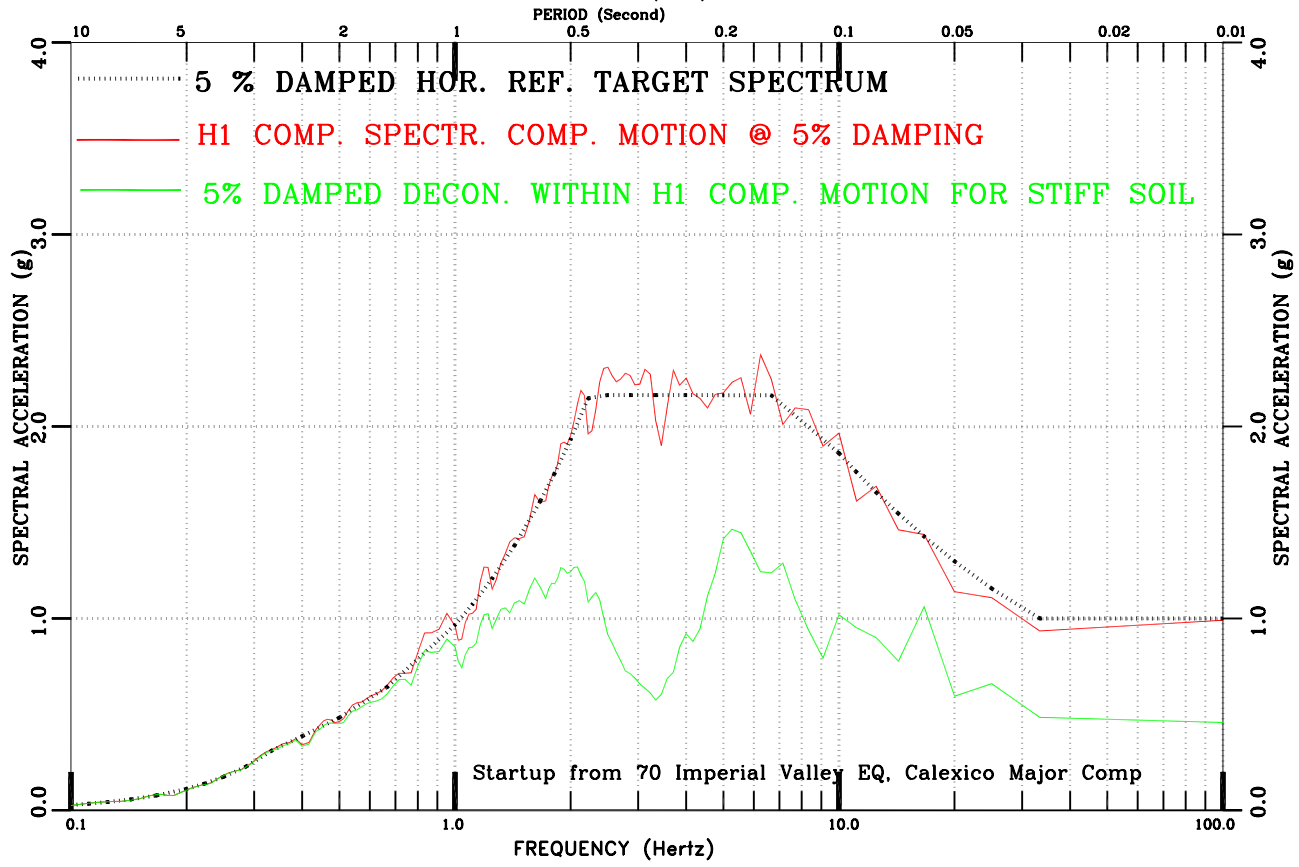
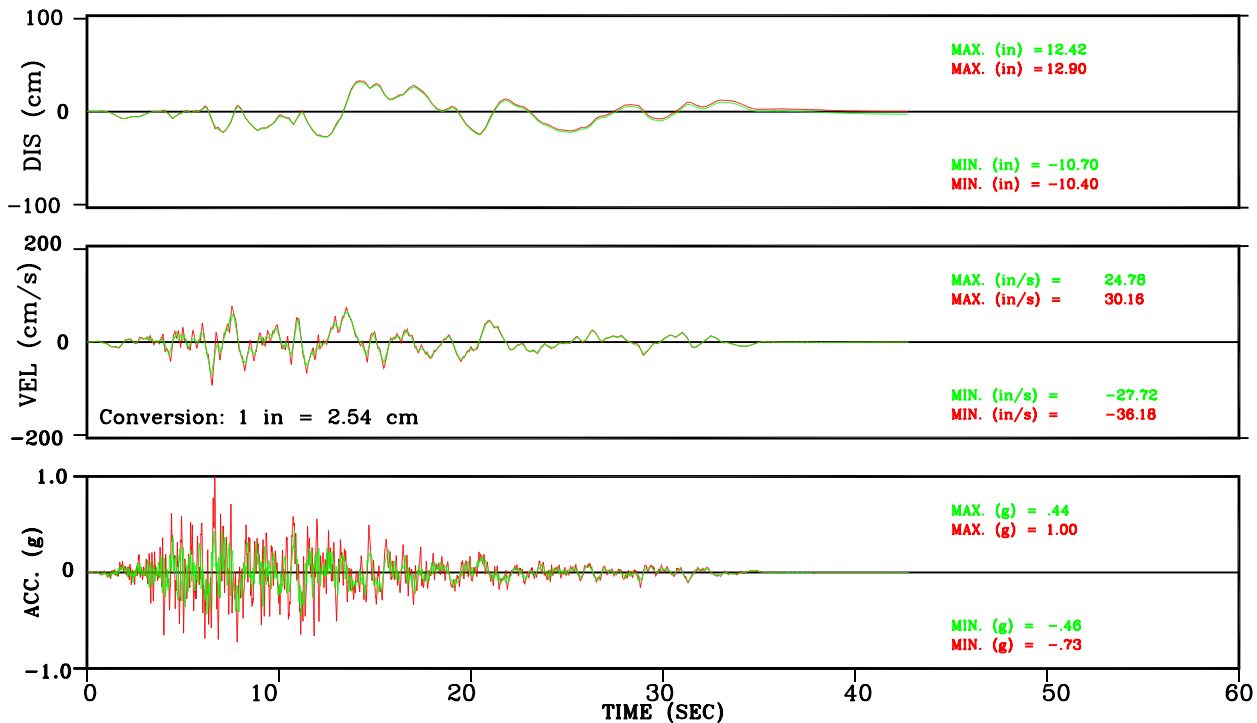


Figure III-52: Deconvolved Within vs. Surface Motion for Stiff Soil Set-5 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

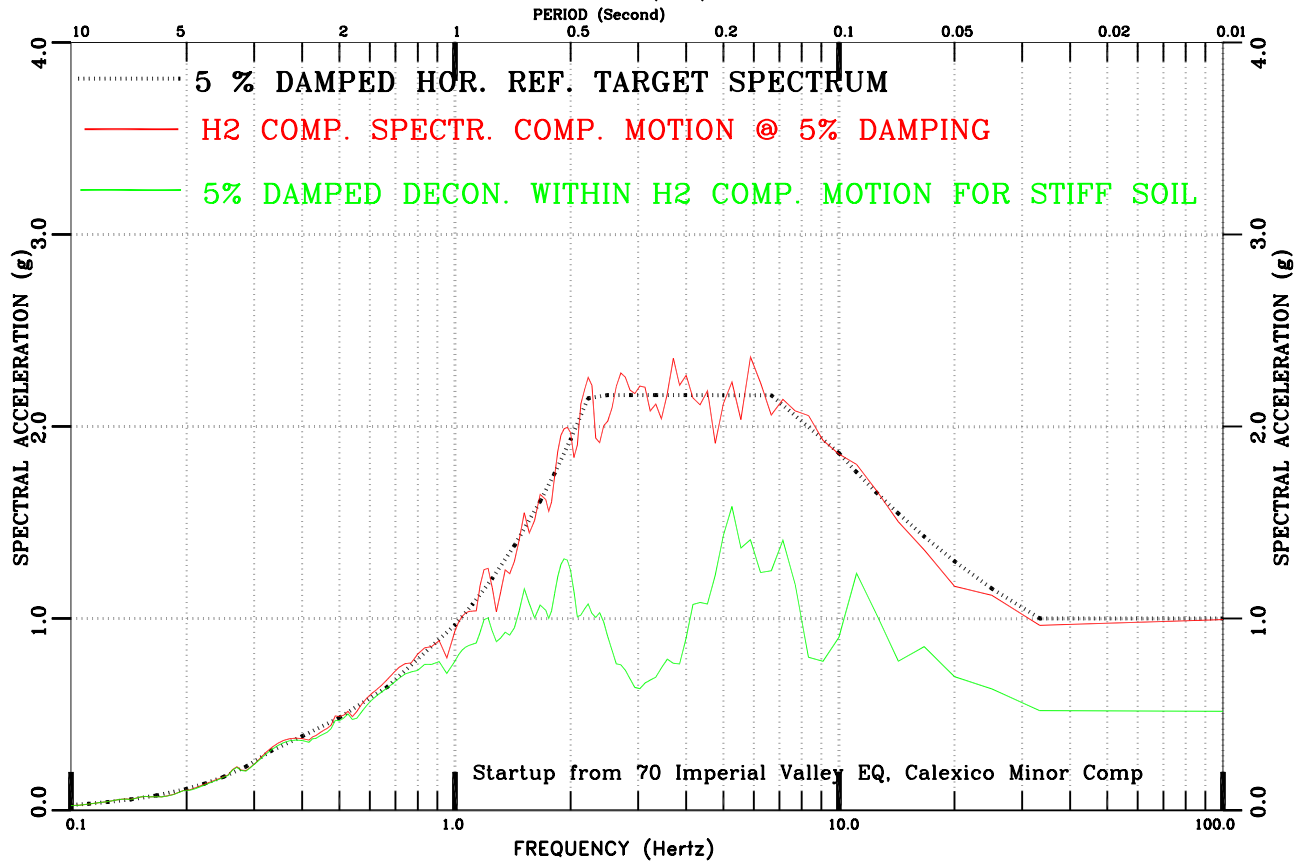
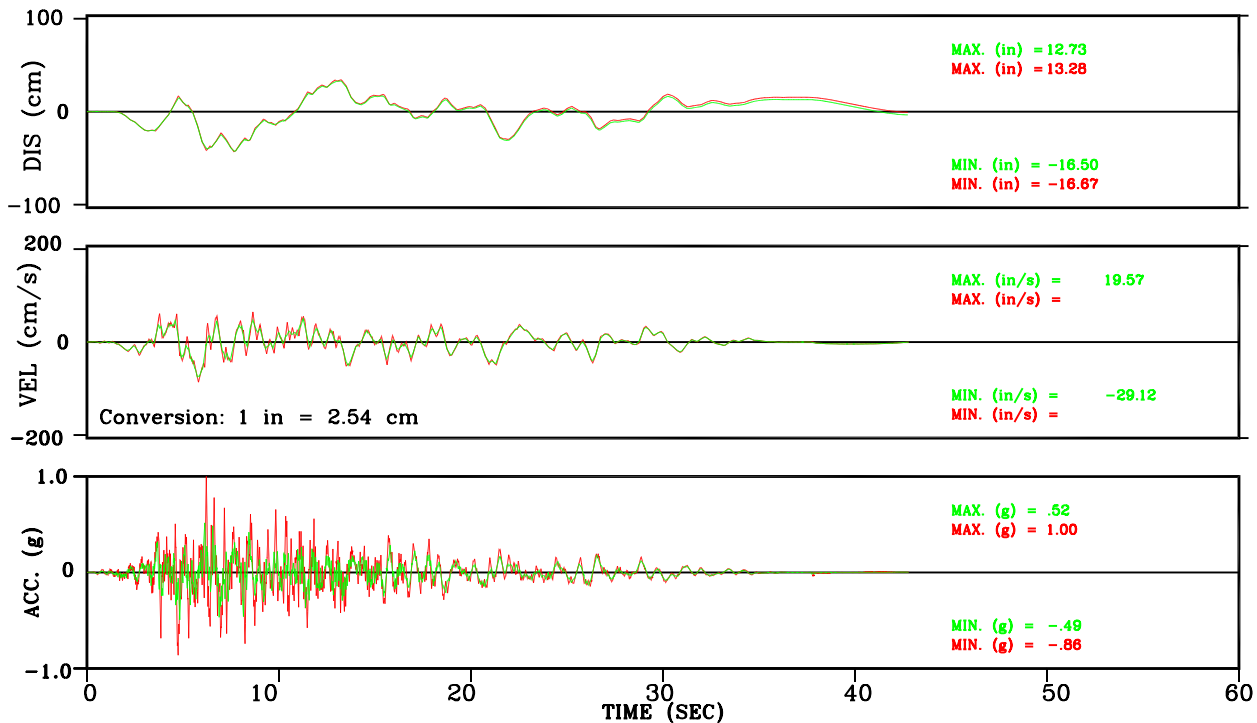


Figure III-53: Deconvolved Within vs. Surface Motion for Stiff Soil Set-5 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape



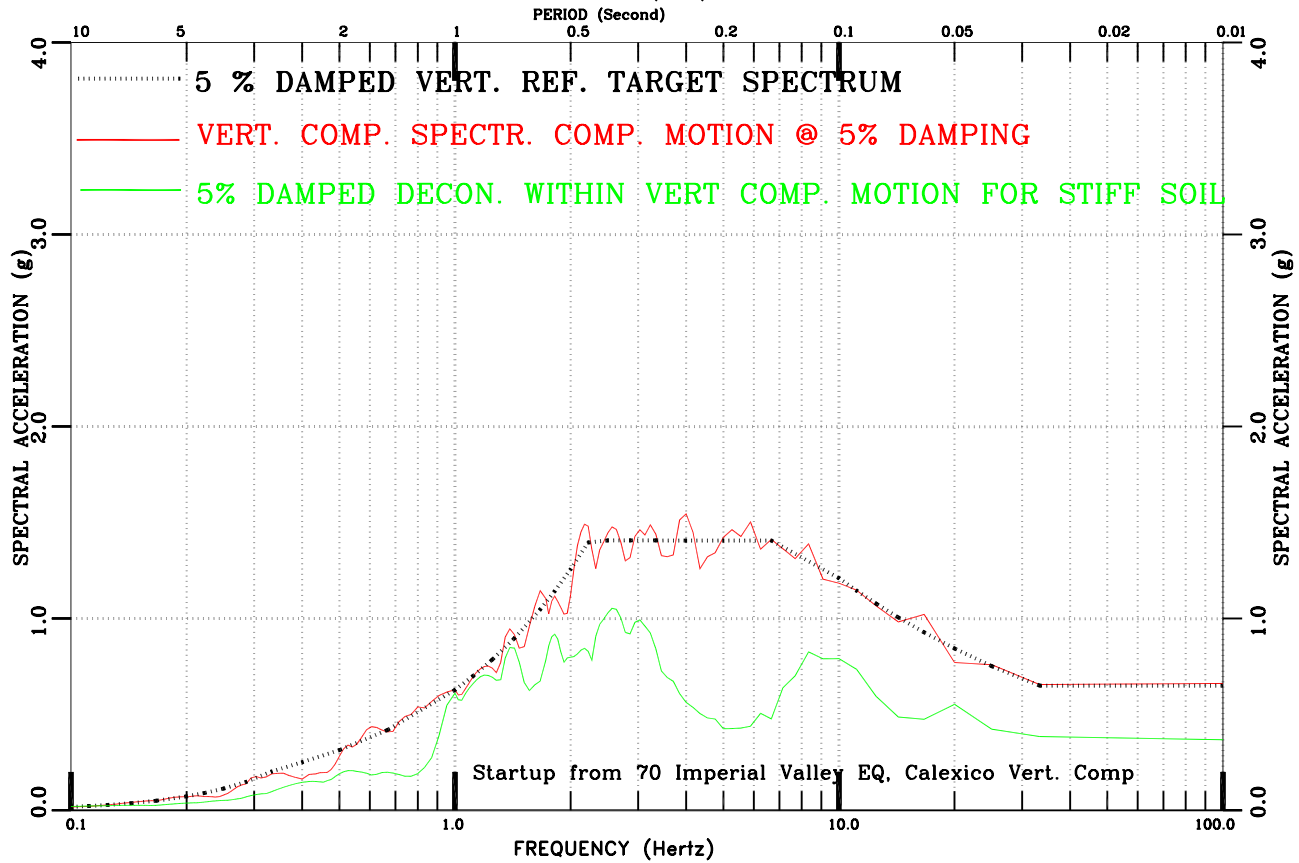
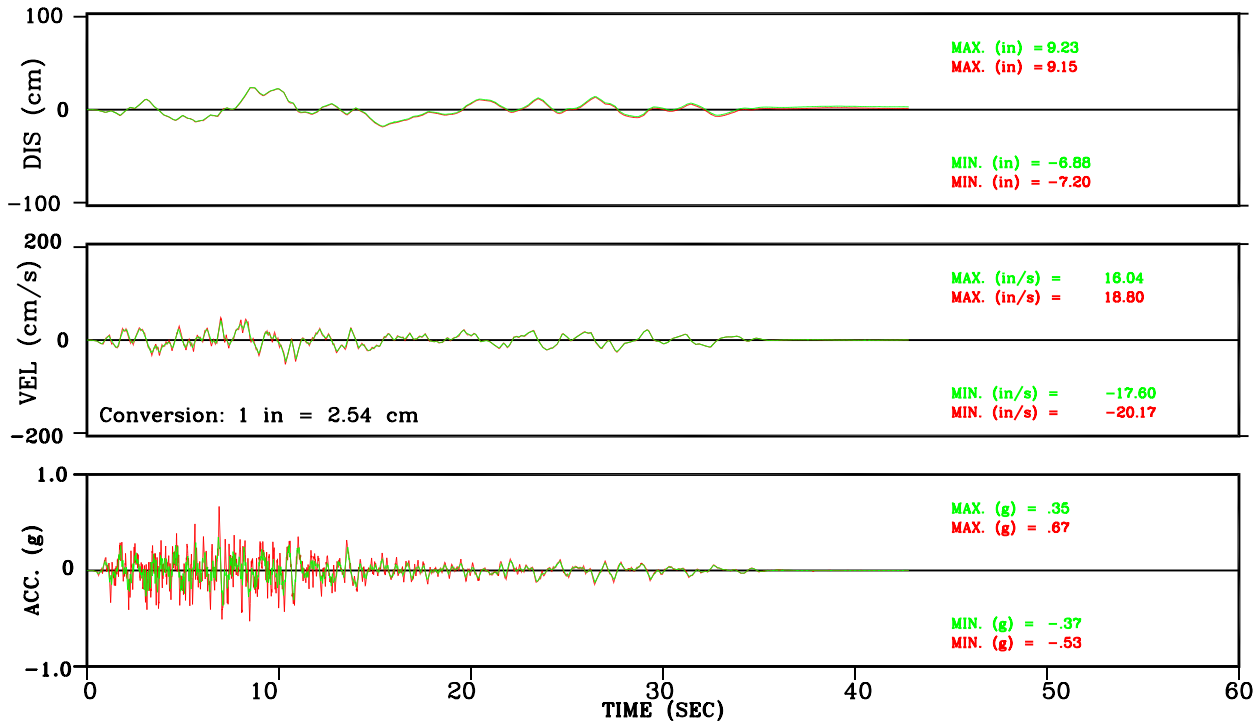


Figure III-54: Deconvolved Within vs. Surface Motion for Stiff Soil Set-5 VERT Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

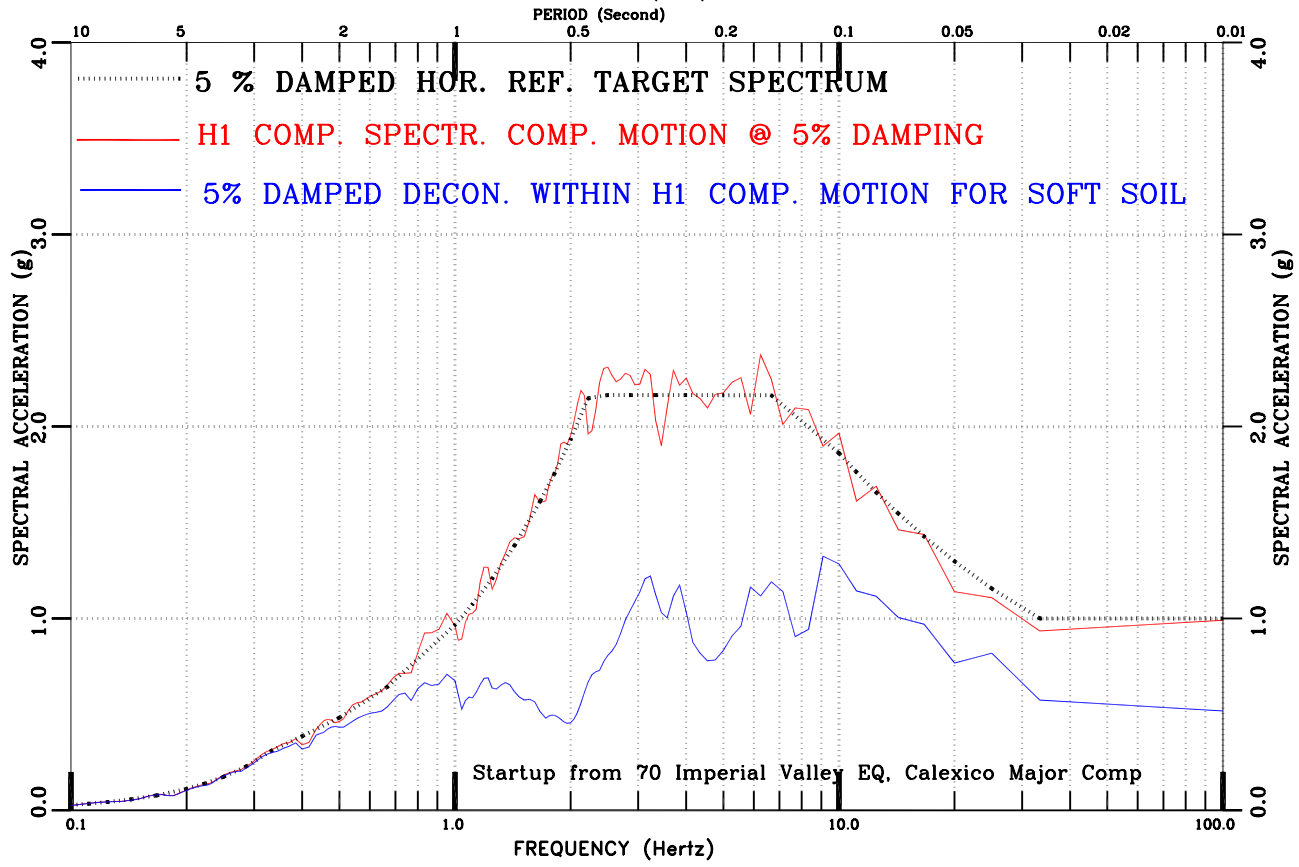
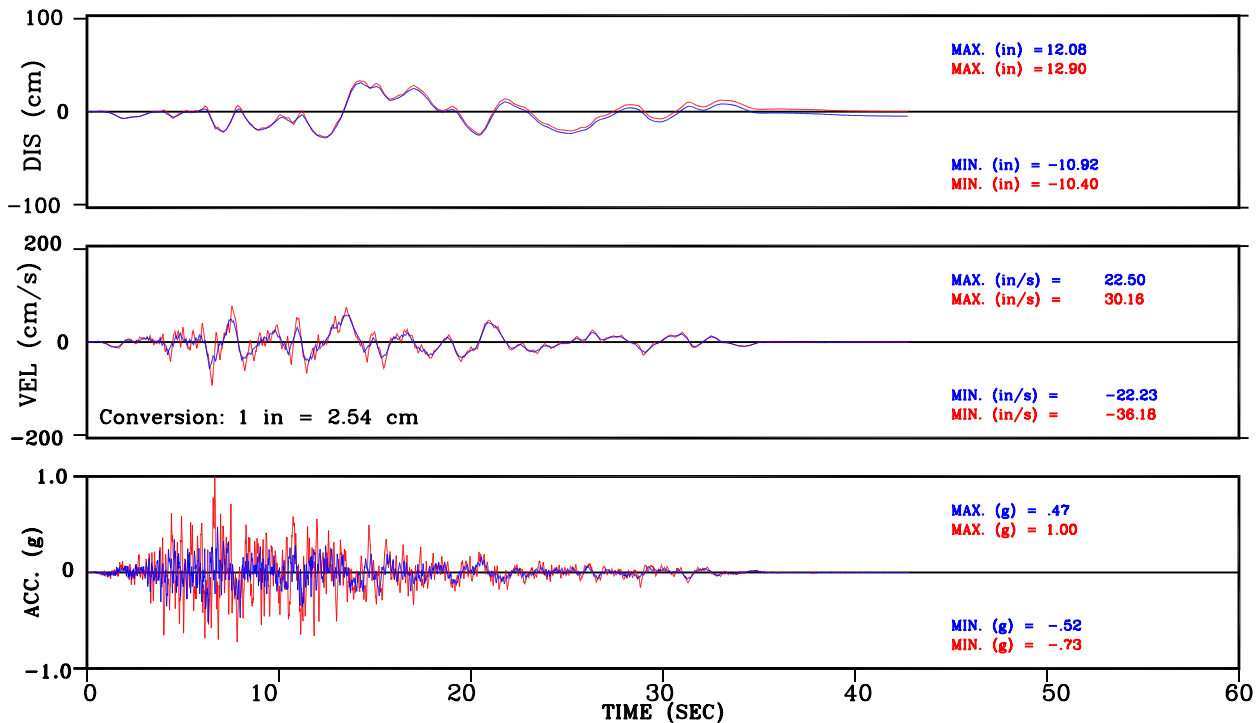


Figure III-55: Deconvolved Within vs. Surface Motion for Soft Soil Set-5 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

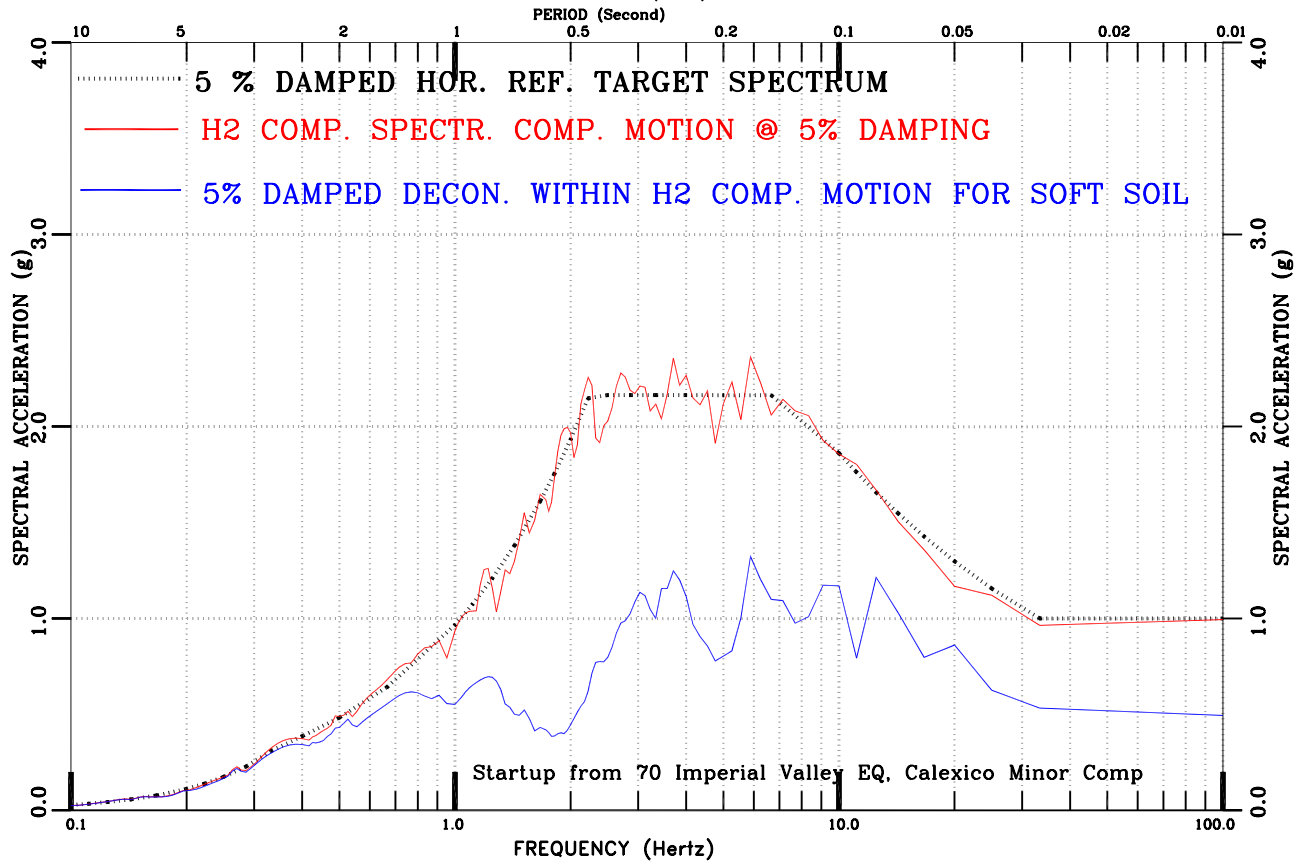
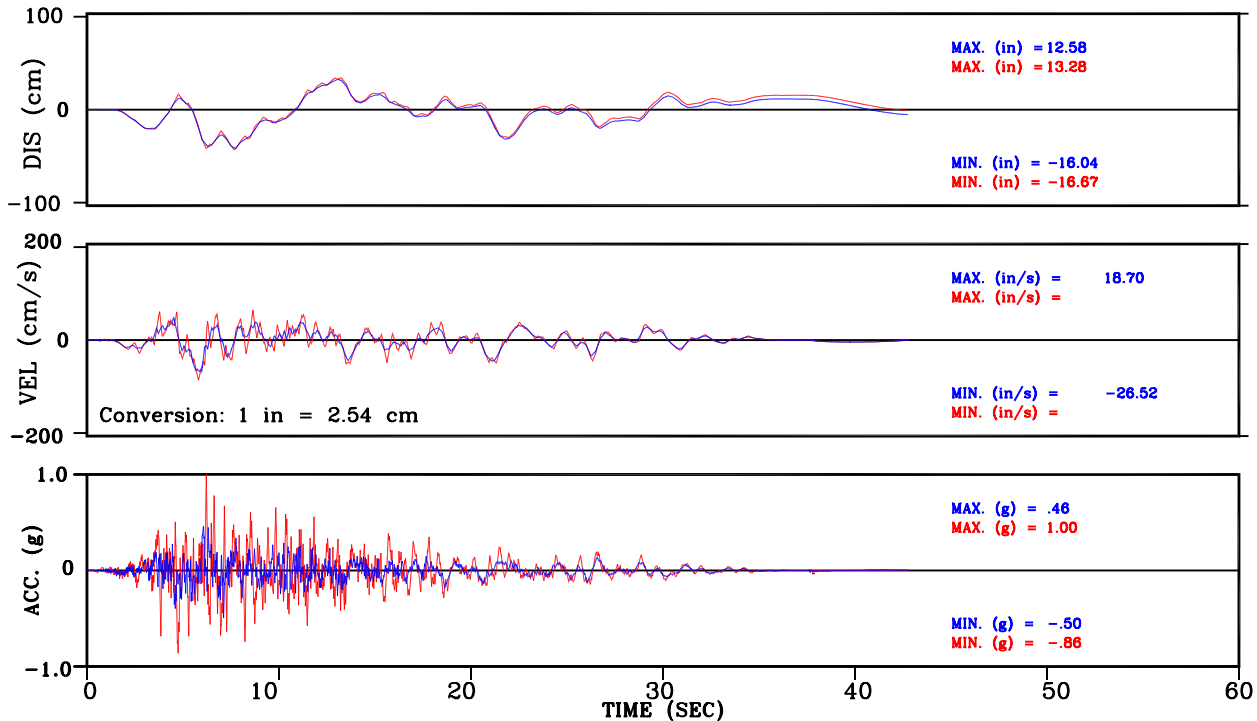


Figure III-56: Deconvolved Within vs. Surface Motion for Soft Soil Set-5 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

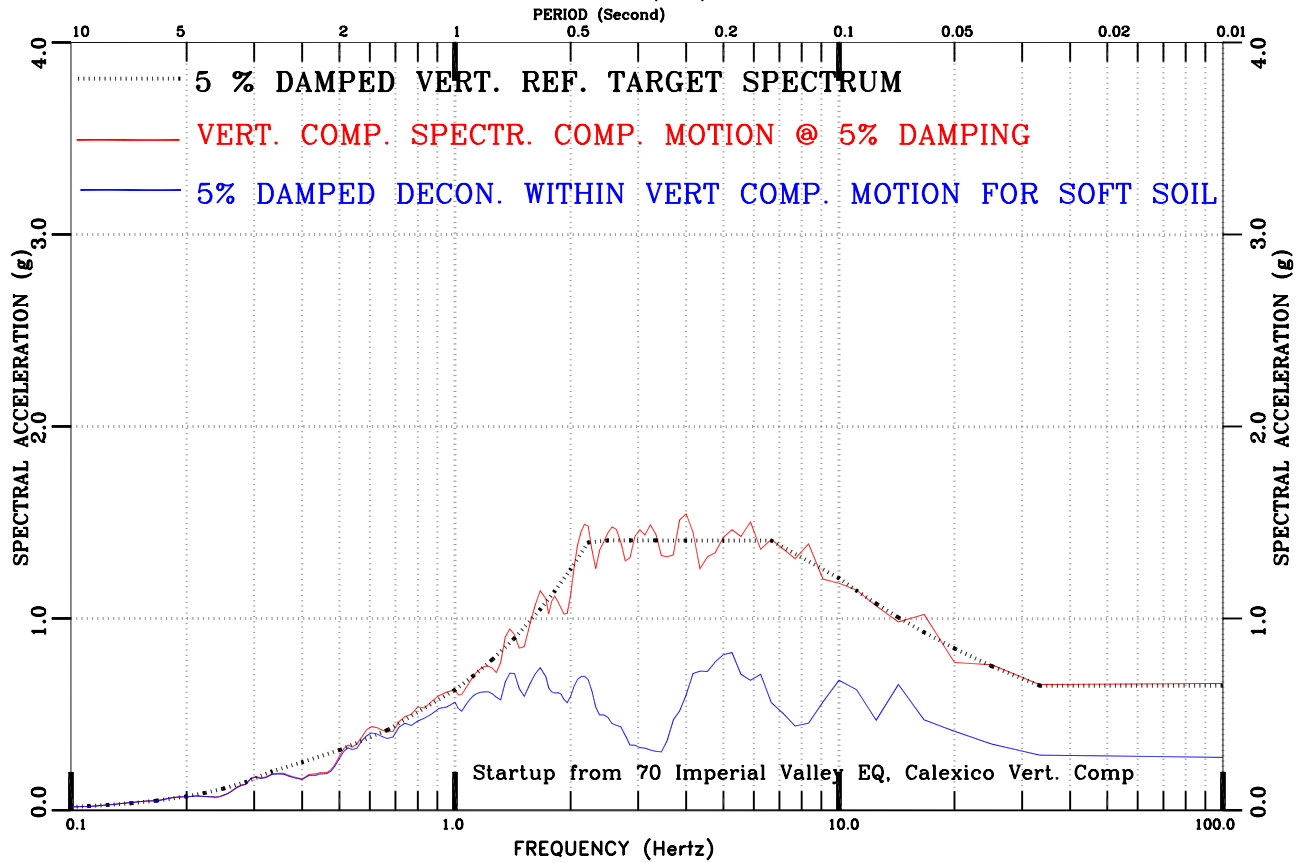
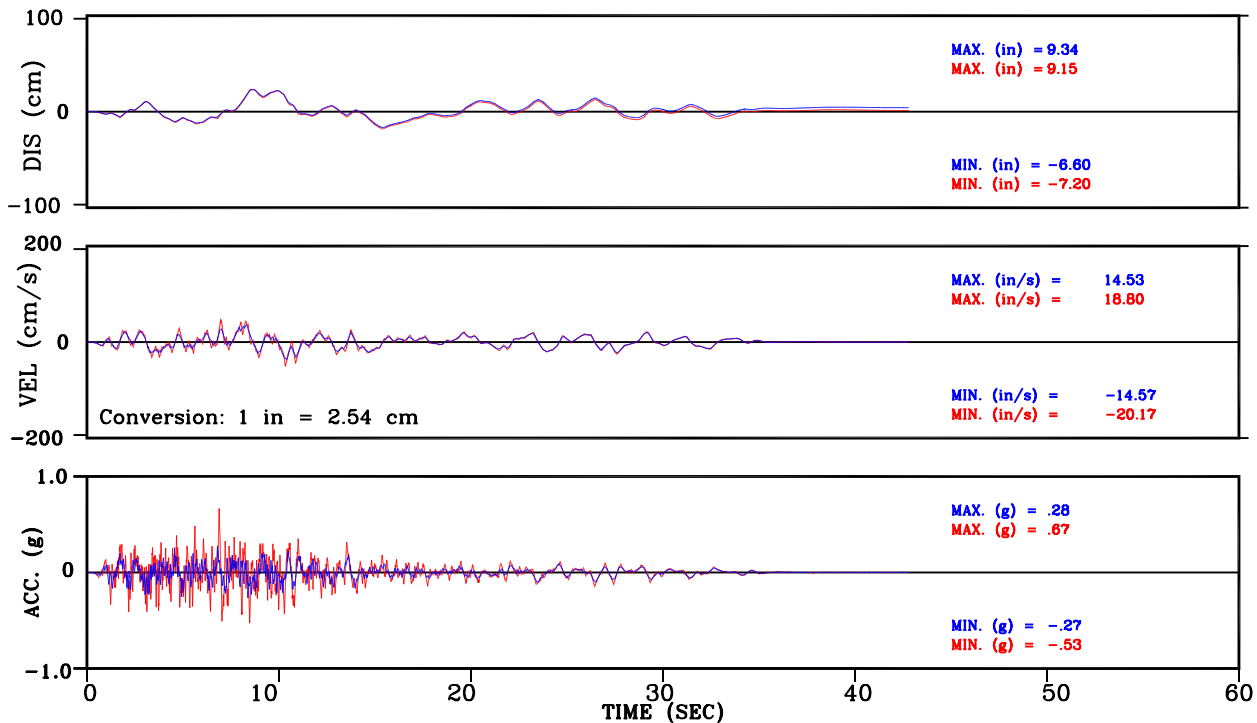


Figure III-57: Deconvolved Within vs. Surface Motion for Soft Soil Set-5 VERT Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

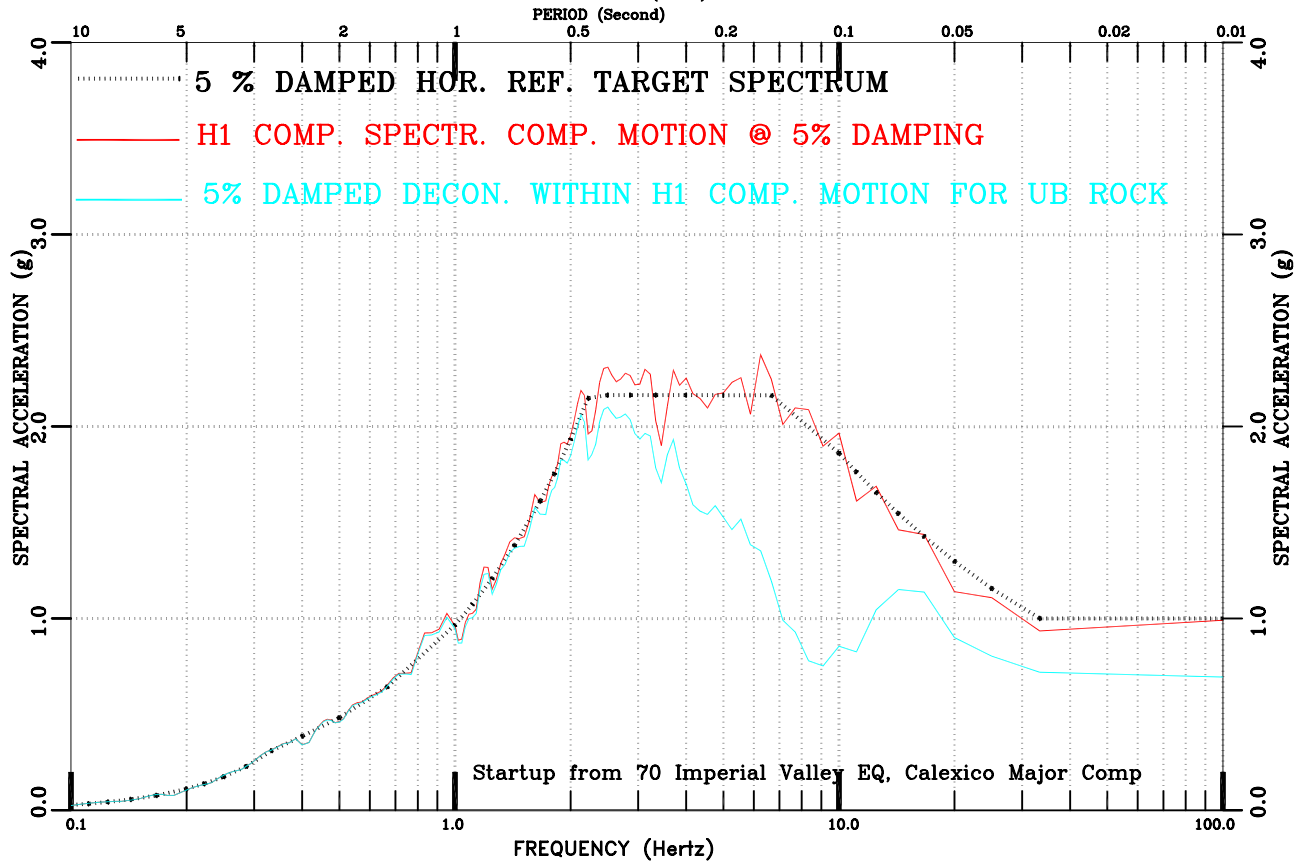
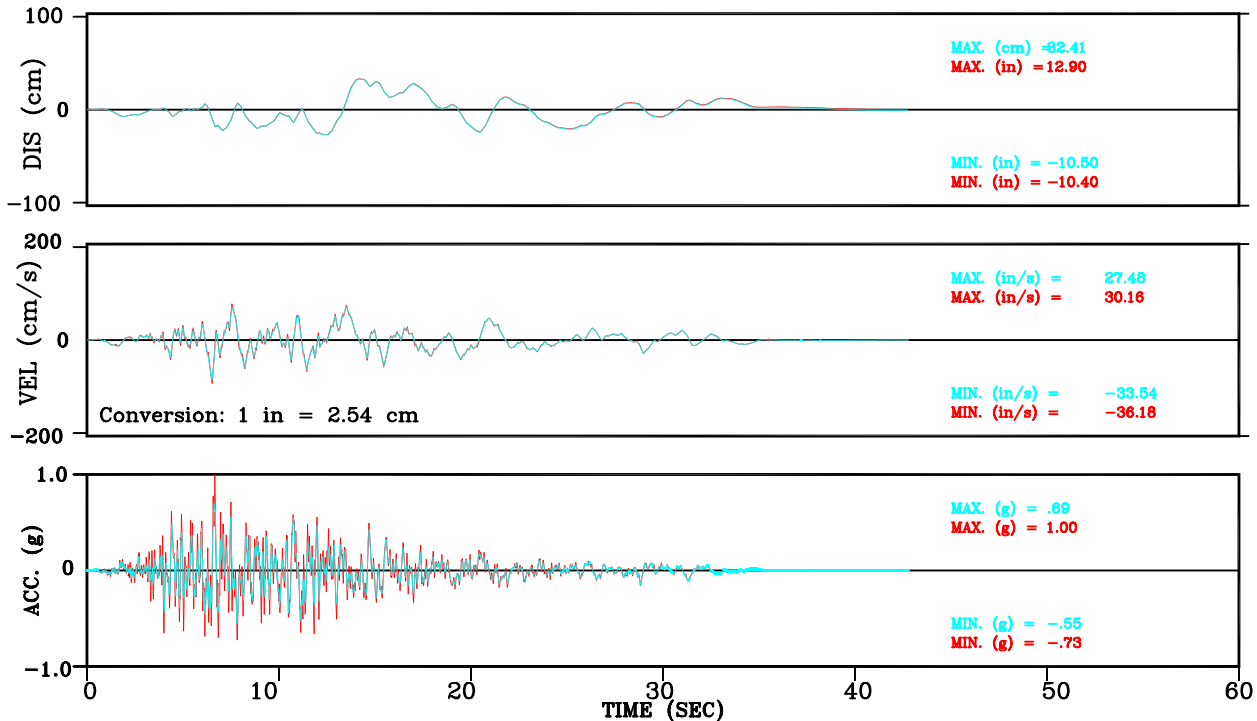


Figure III-58: Deconvolved Within vs. Surface Motion for UB Rock Set-5 H1 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

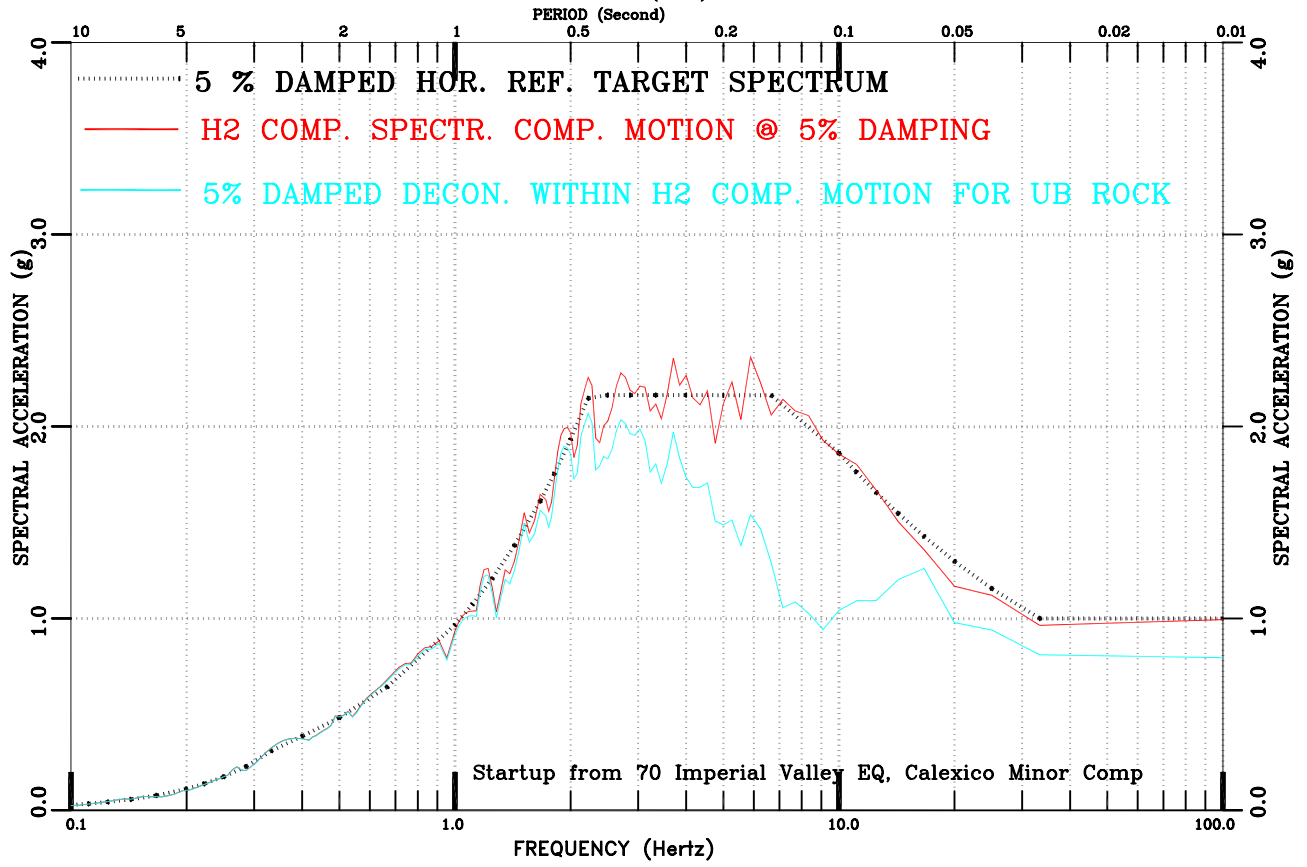
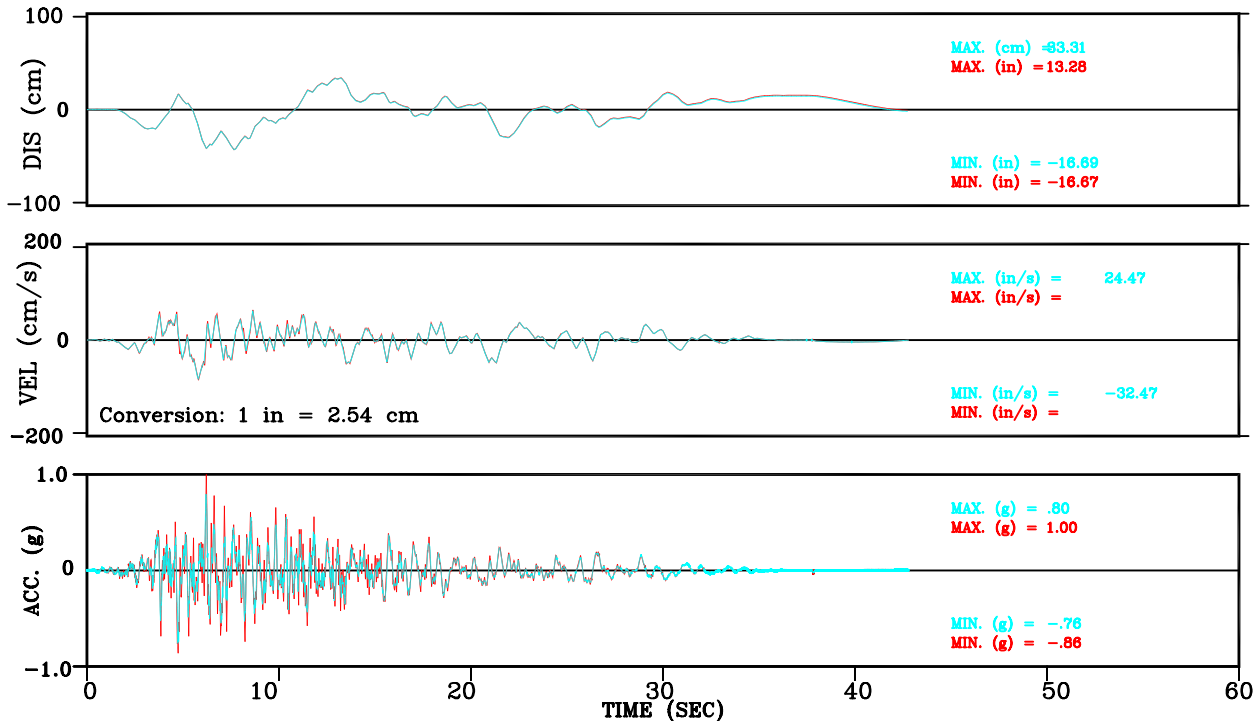


Figure III-59: Deconvolved Within vs. Surface Motion for UB Rock Set-5 H2 Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

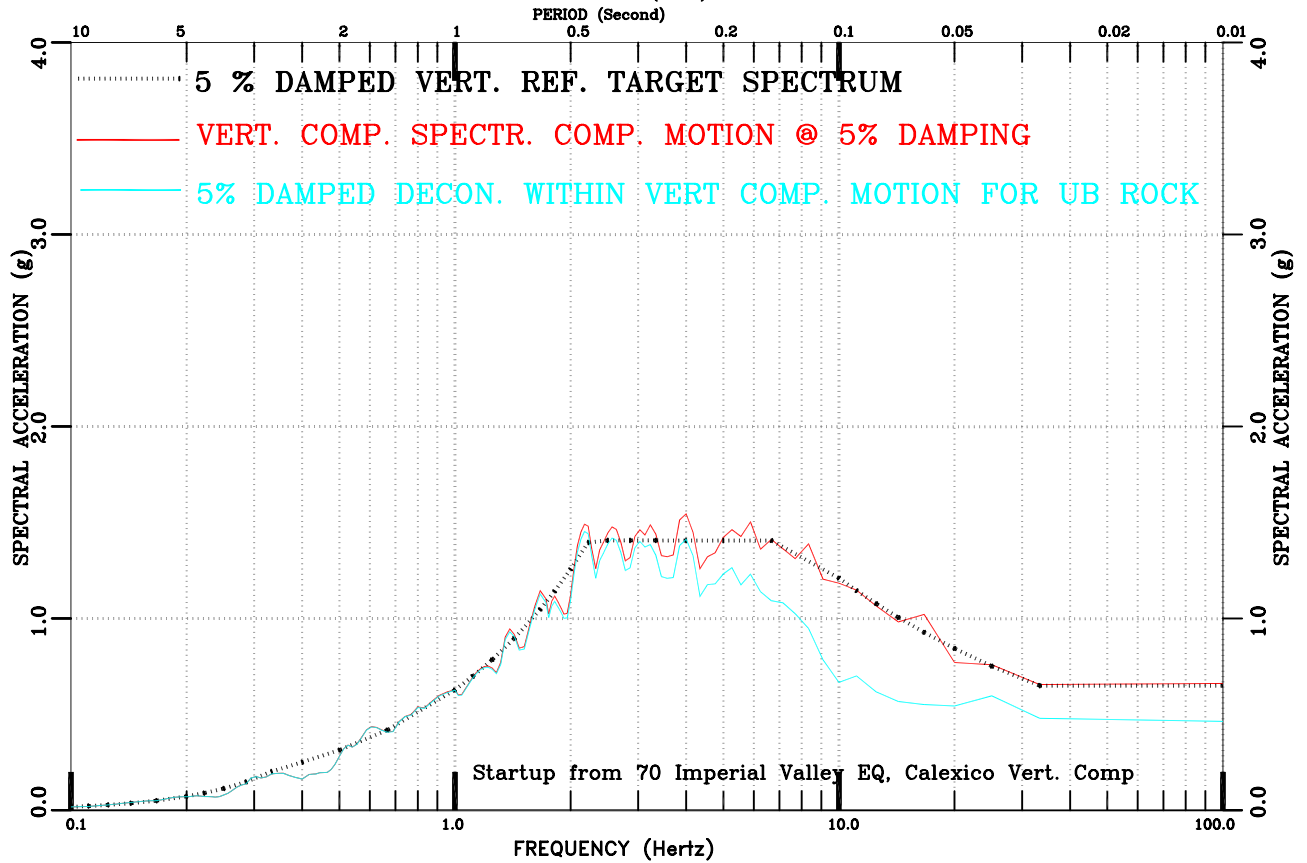
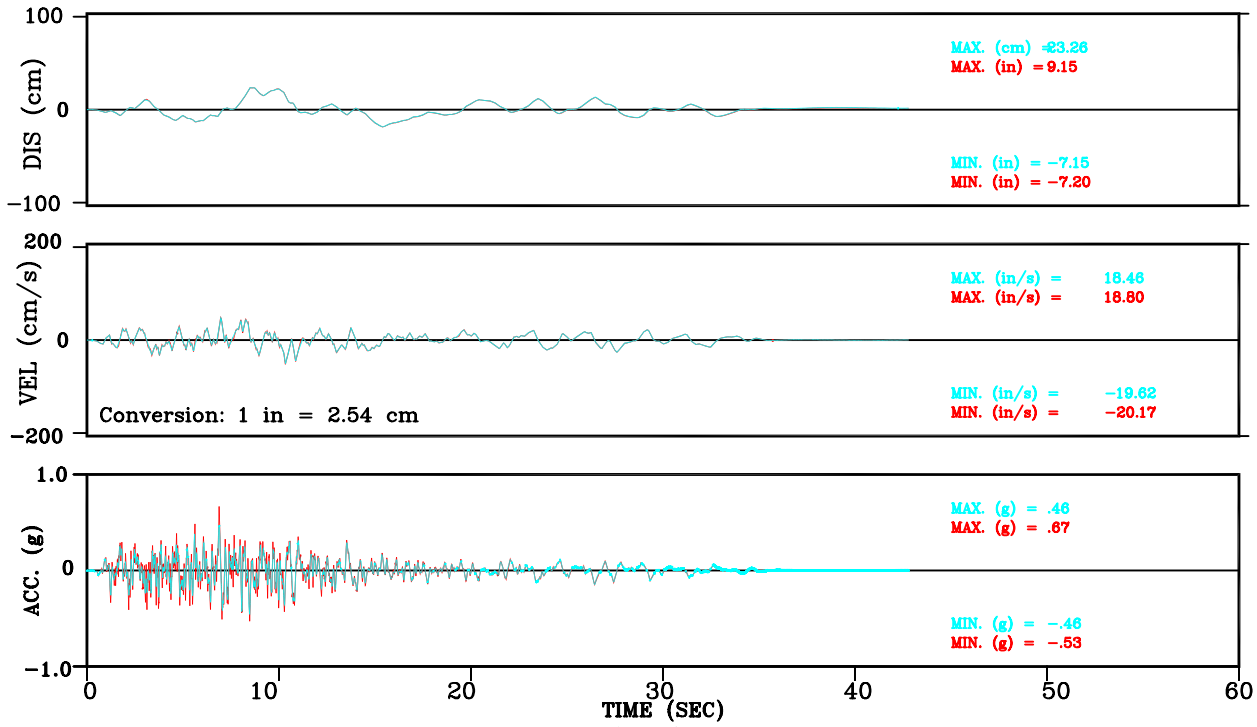


Figure III-60: Deconvolved Within vs. Surface Motion for UB Rock Set-5 VERT Comp. Motion Conforming to NUREG/CR-0098 Spectral Shape

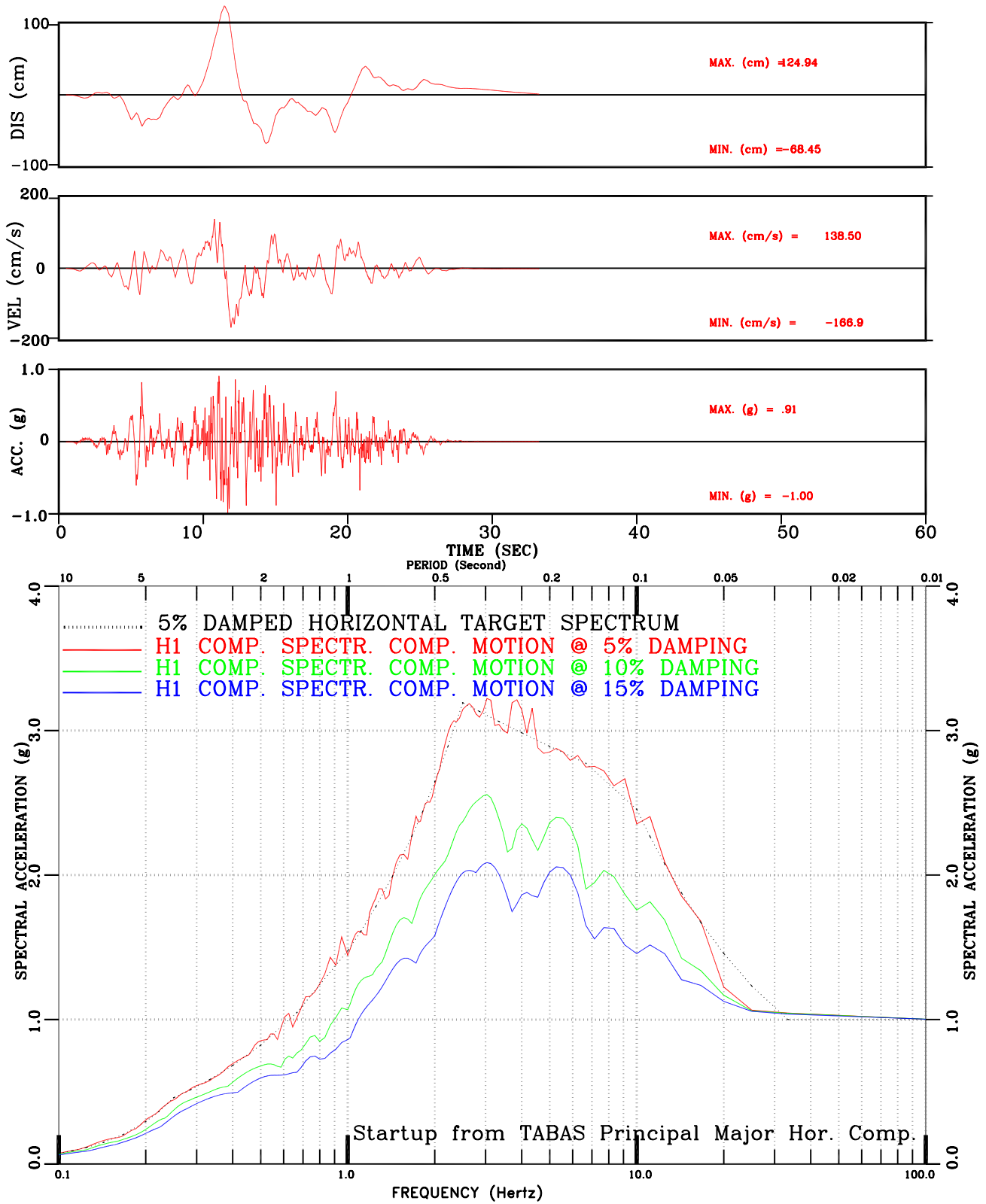


Figure III-61: Set-1 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape



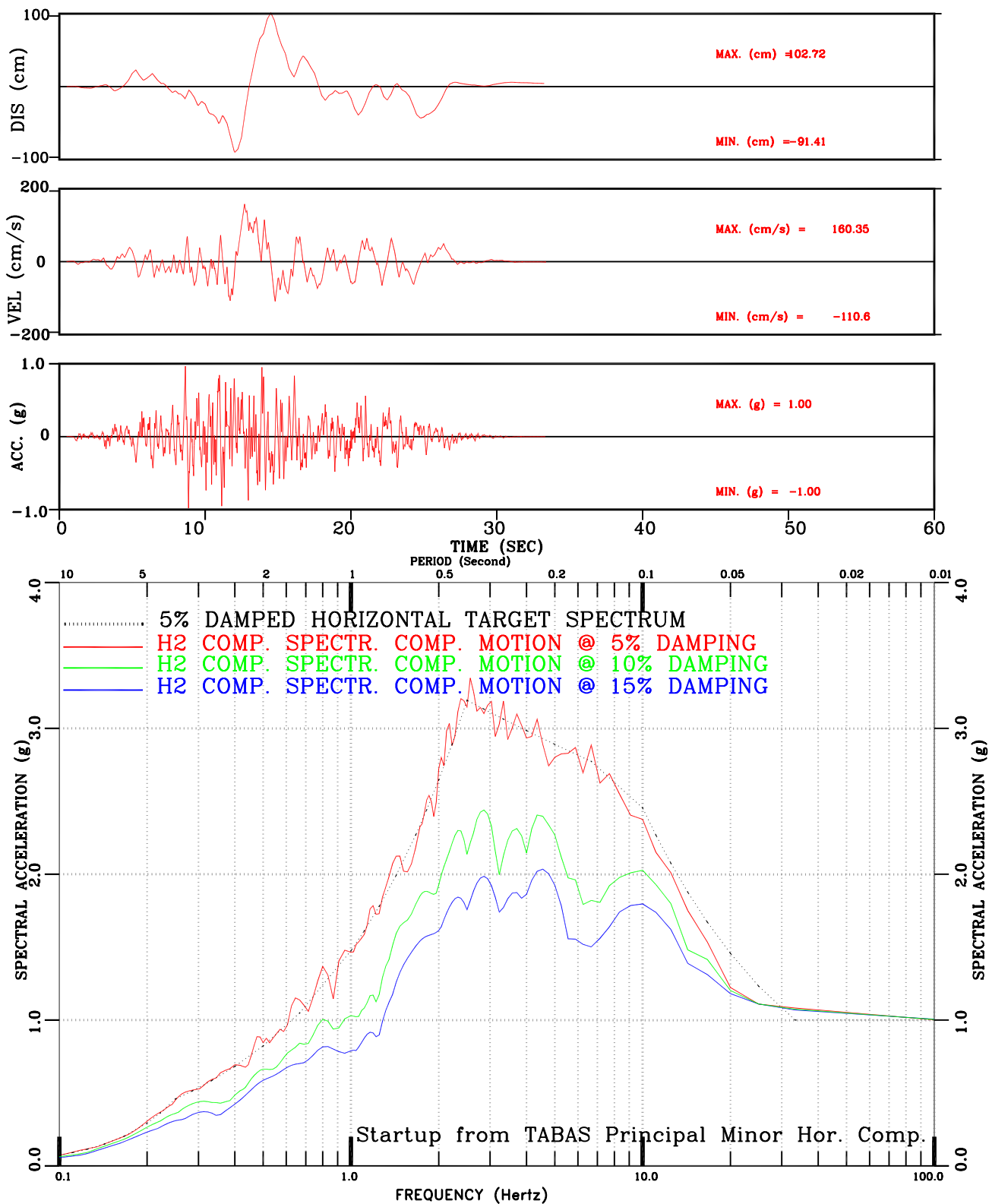


Figure III-62: Set-1 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

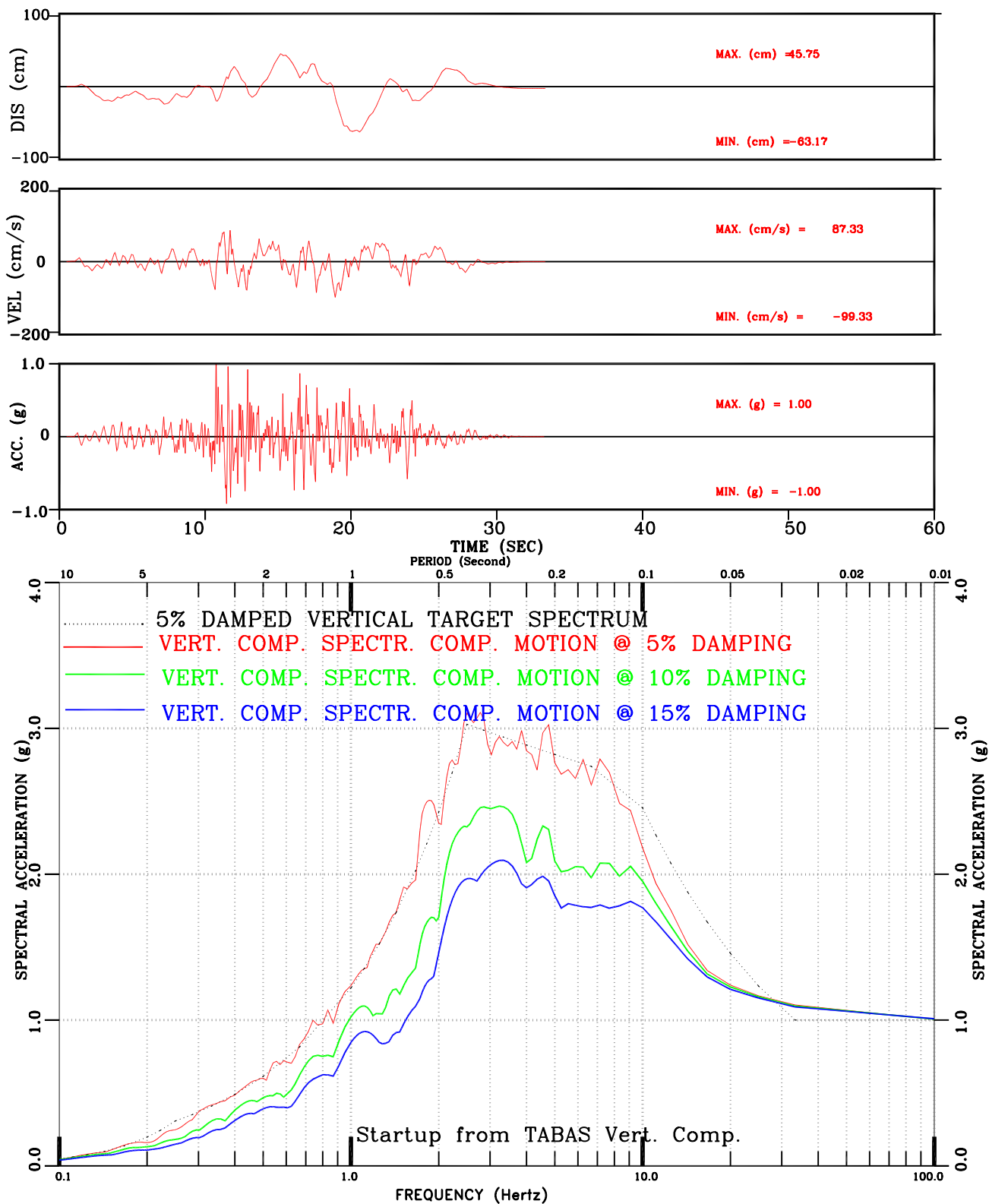


Figure III-63: Set-1 Vert Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

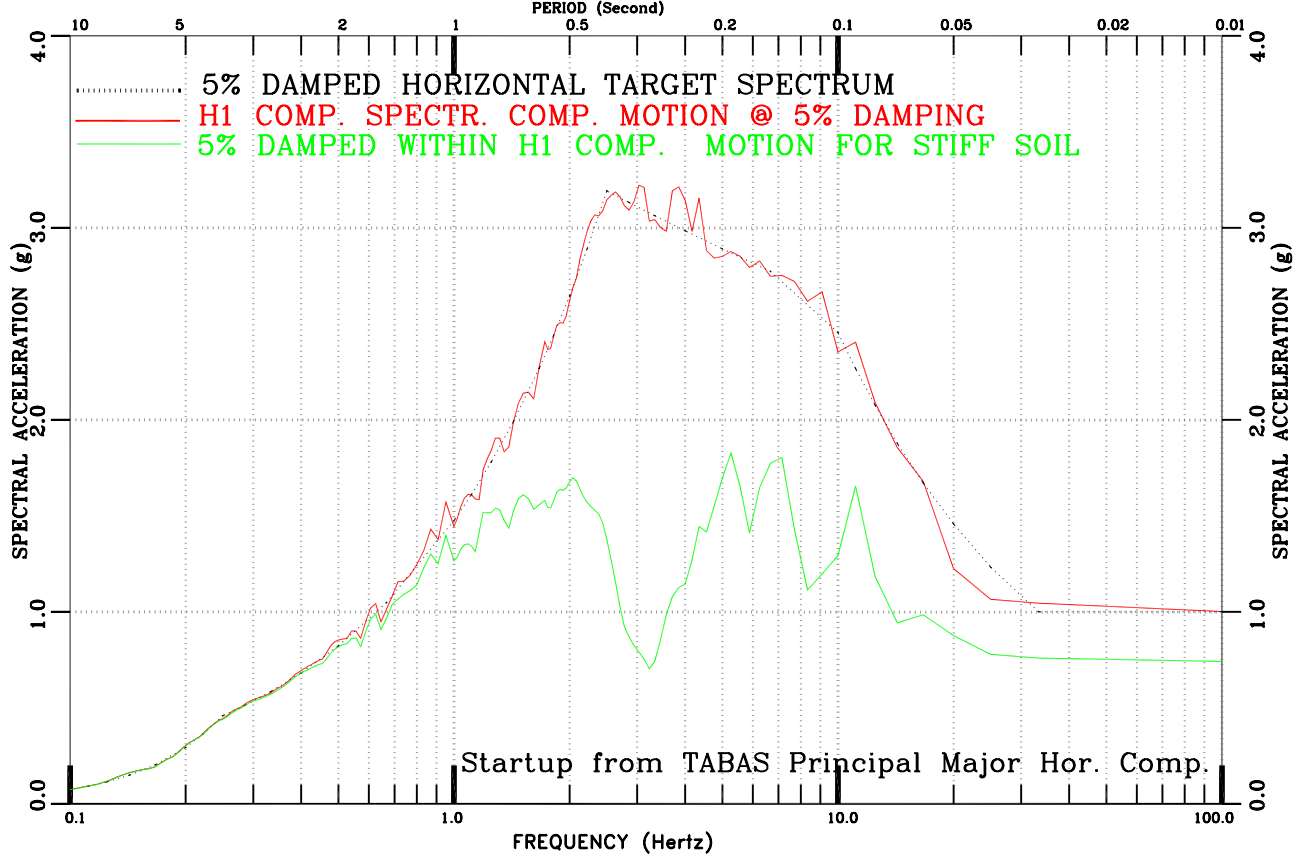
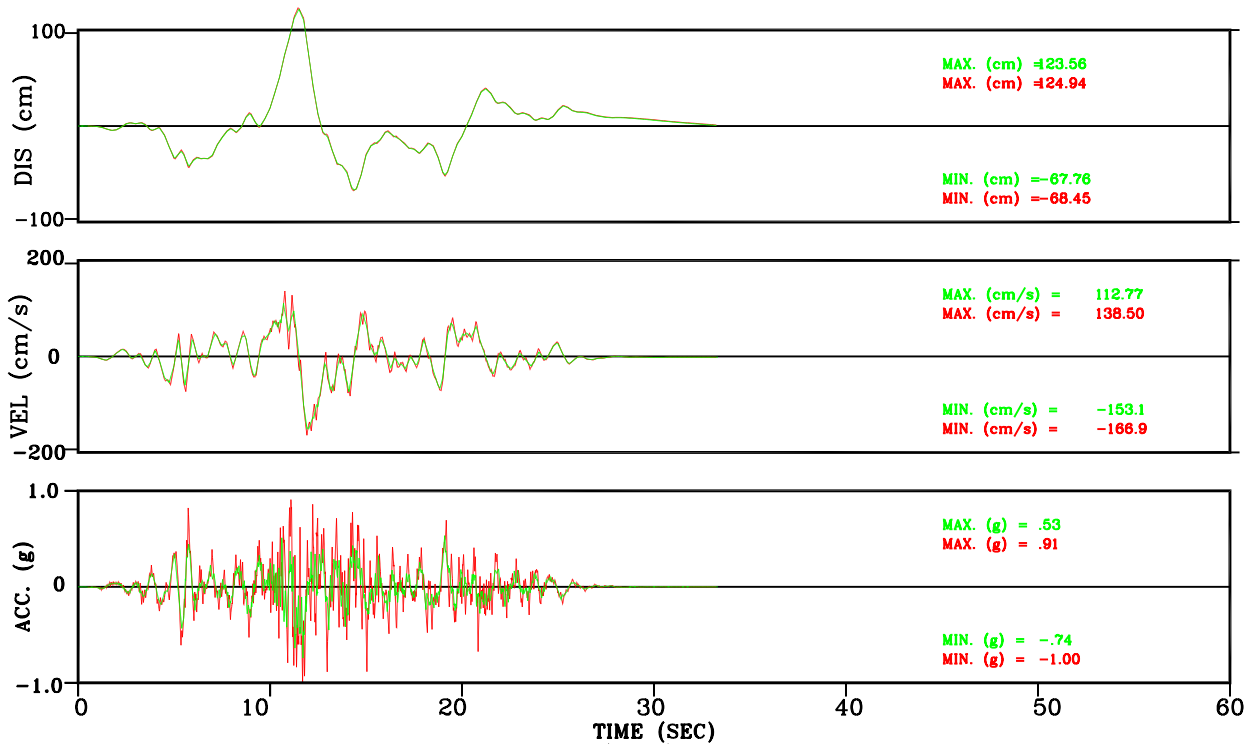


Figure III-64: Within vs. Surface Motion for Stiff Soil Set-1 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

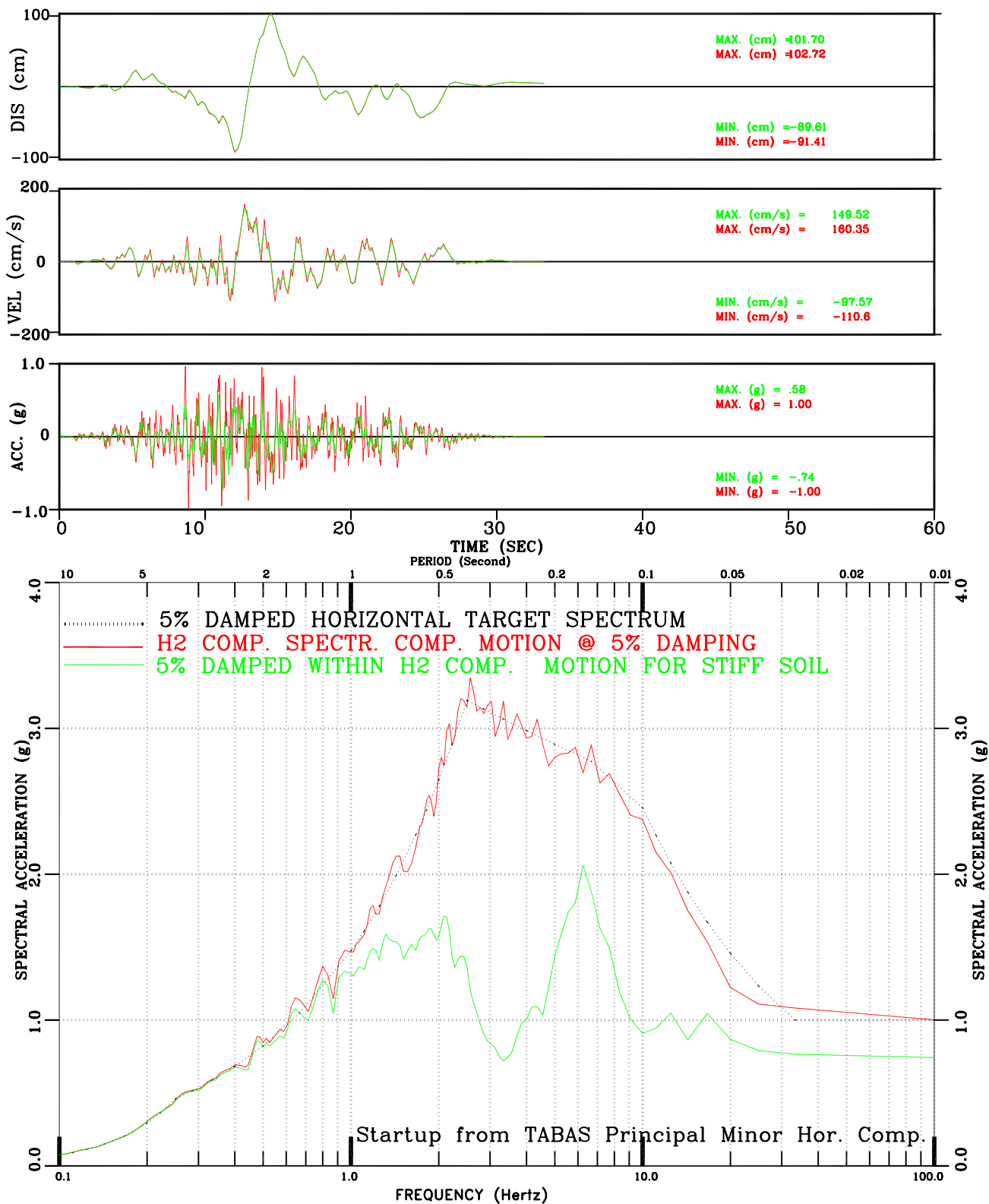


Figure III-65: Within vs. Surface Motion for Stiff Soil  
Set-1 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

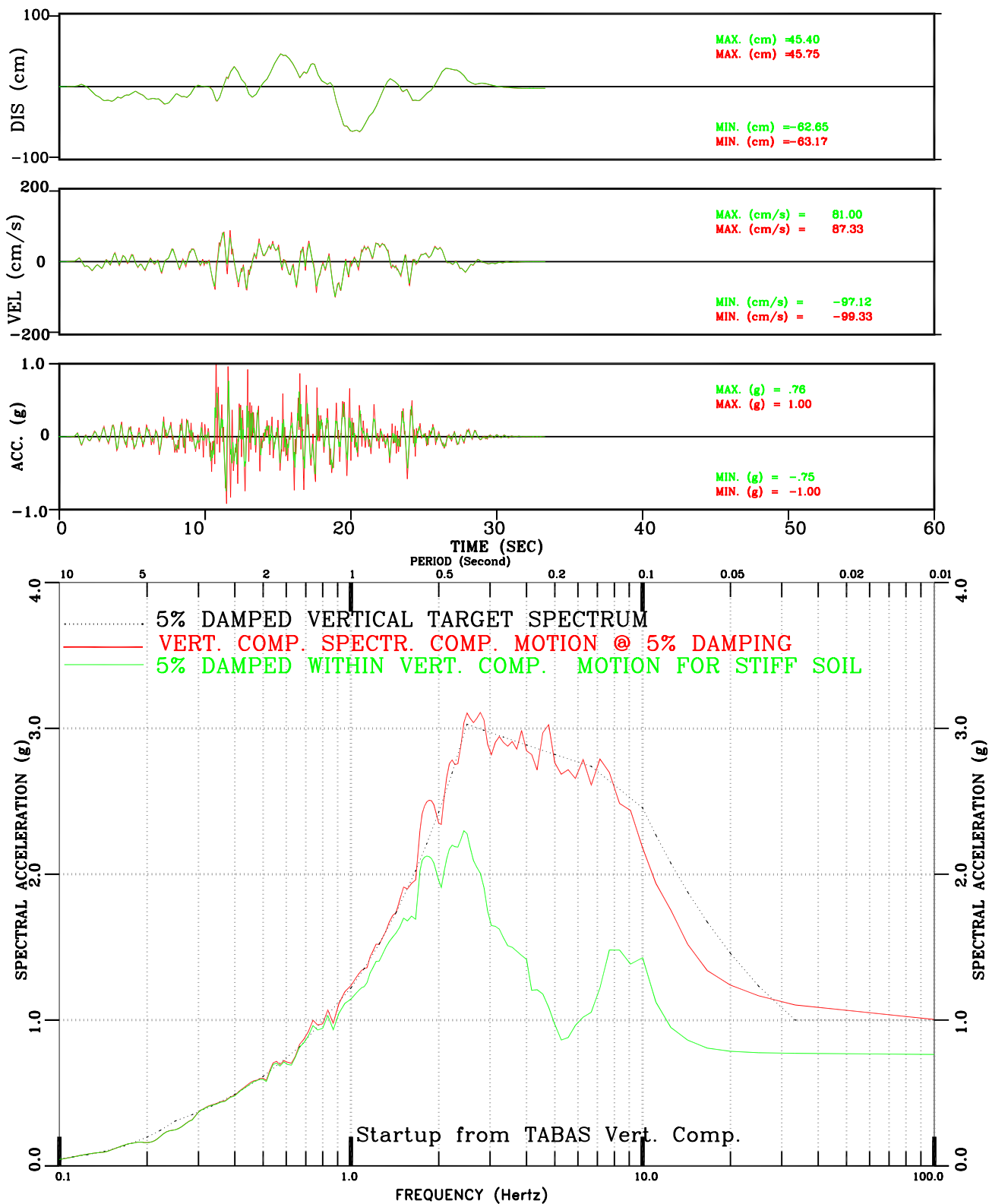


Figure III-66: Within vs. Surface Motion for Stiff Soil  
 Set-1 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

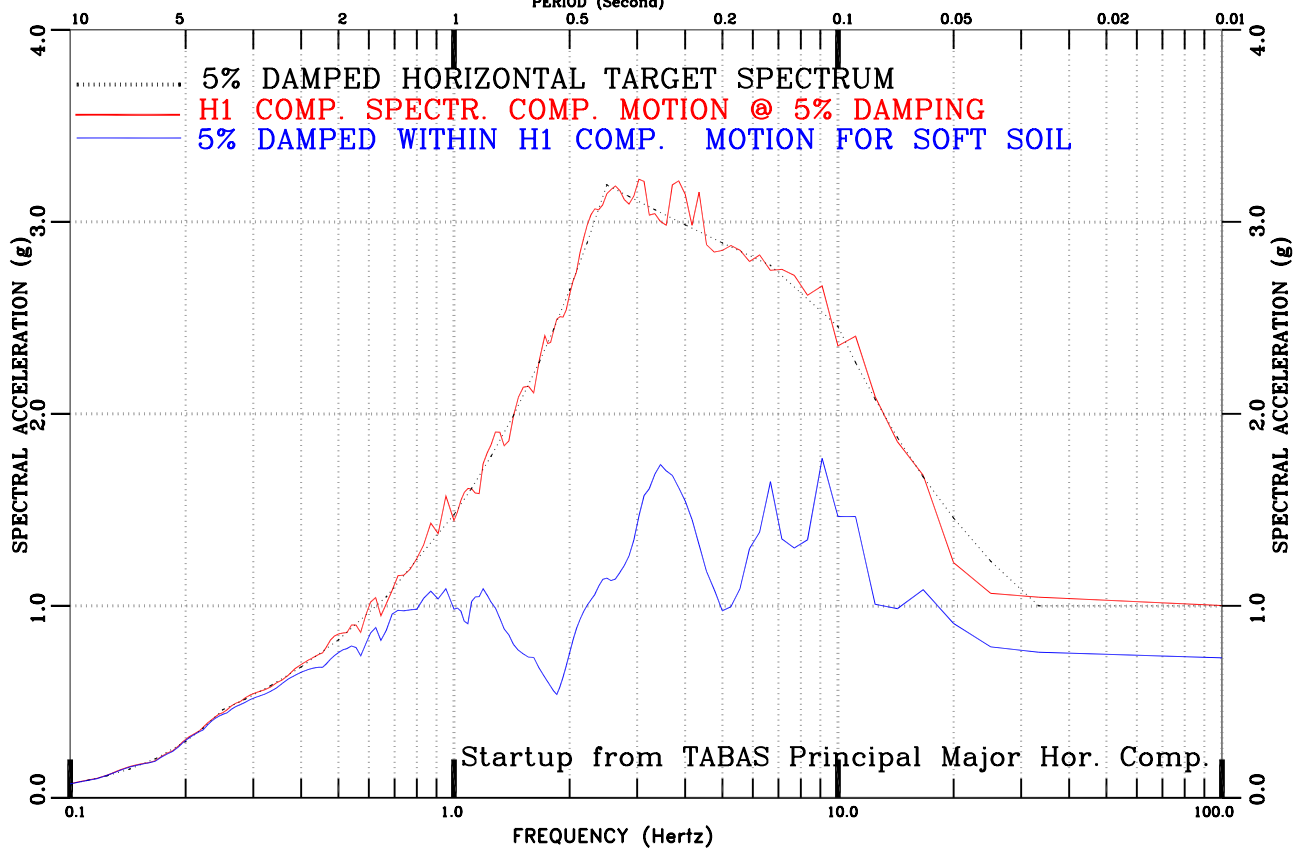
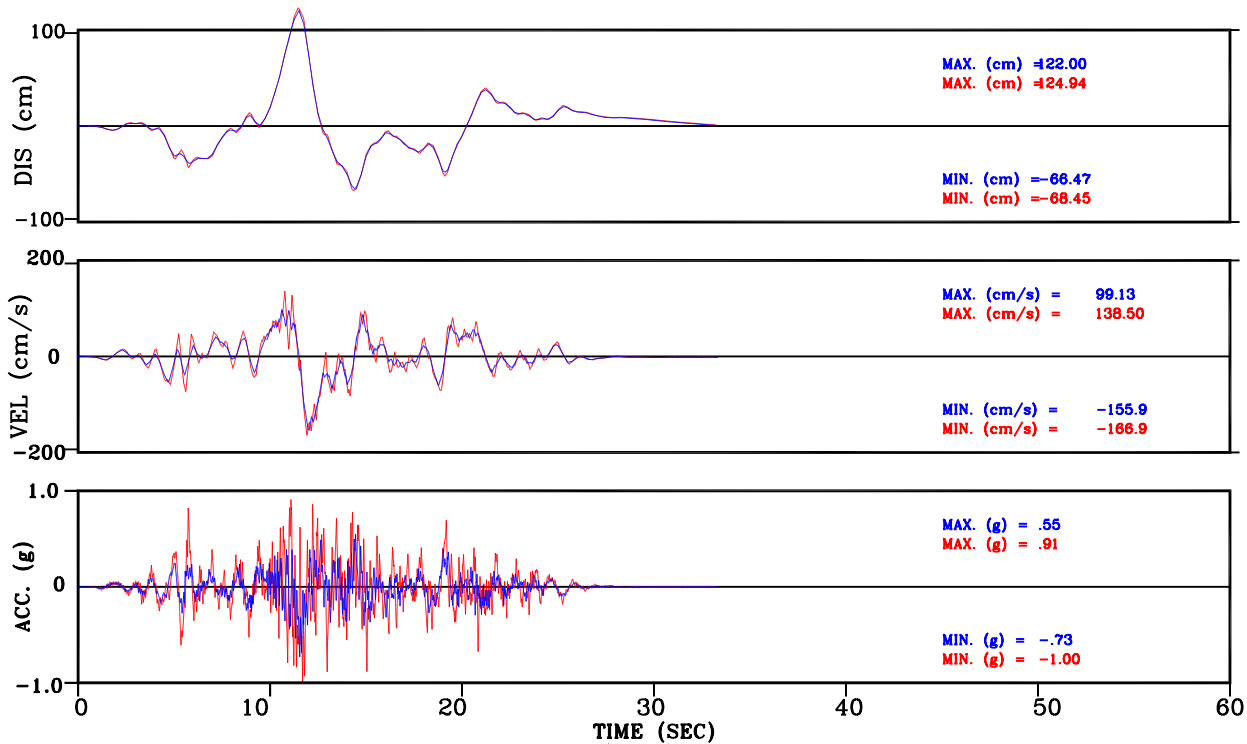


Figure III-67: Within vs. Surface Motion for Soft Soil Set-1 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

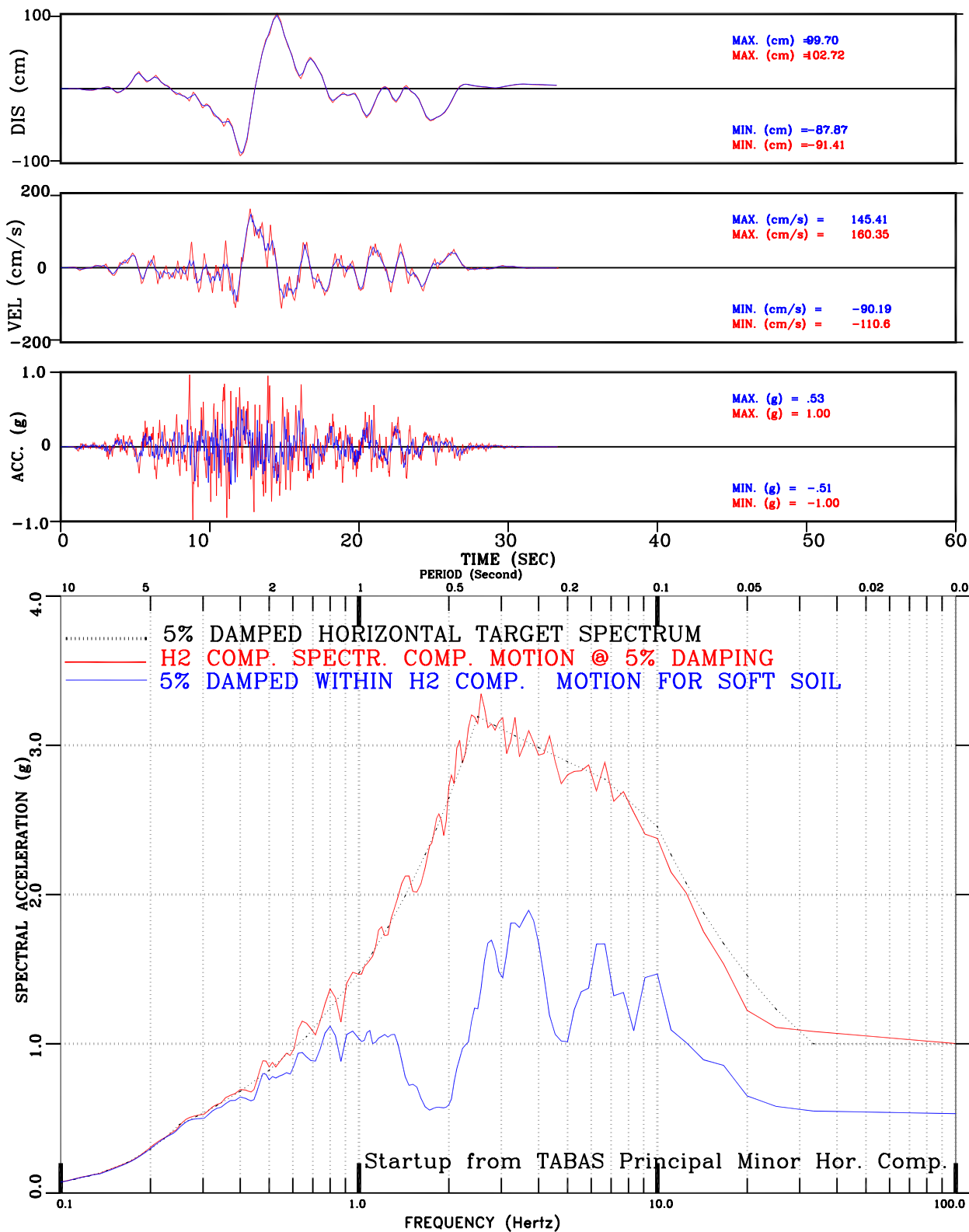


Figure III-68: Within vs. Surface Motion for Soft Soil  
Set-1 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

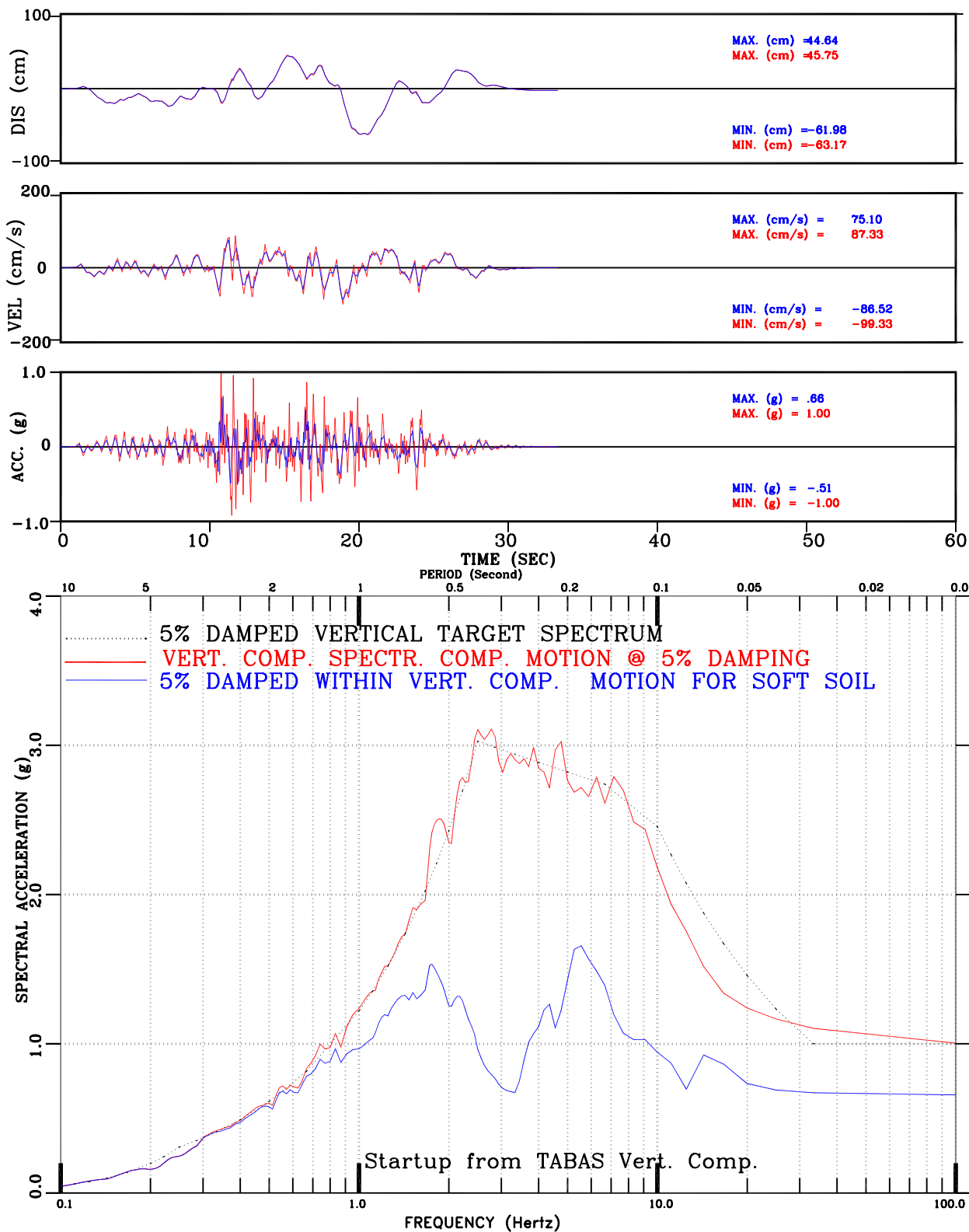


Figure III-69: Within vs. Surface Motion for Soft Soil  
Set-1 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape



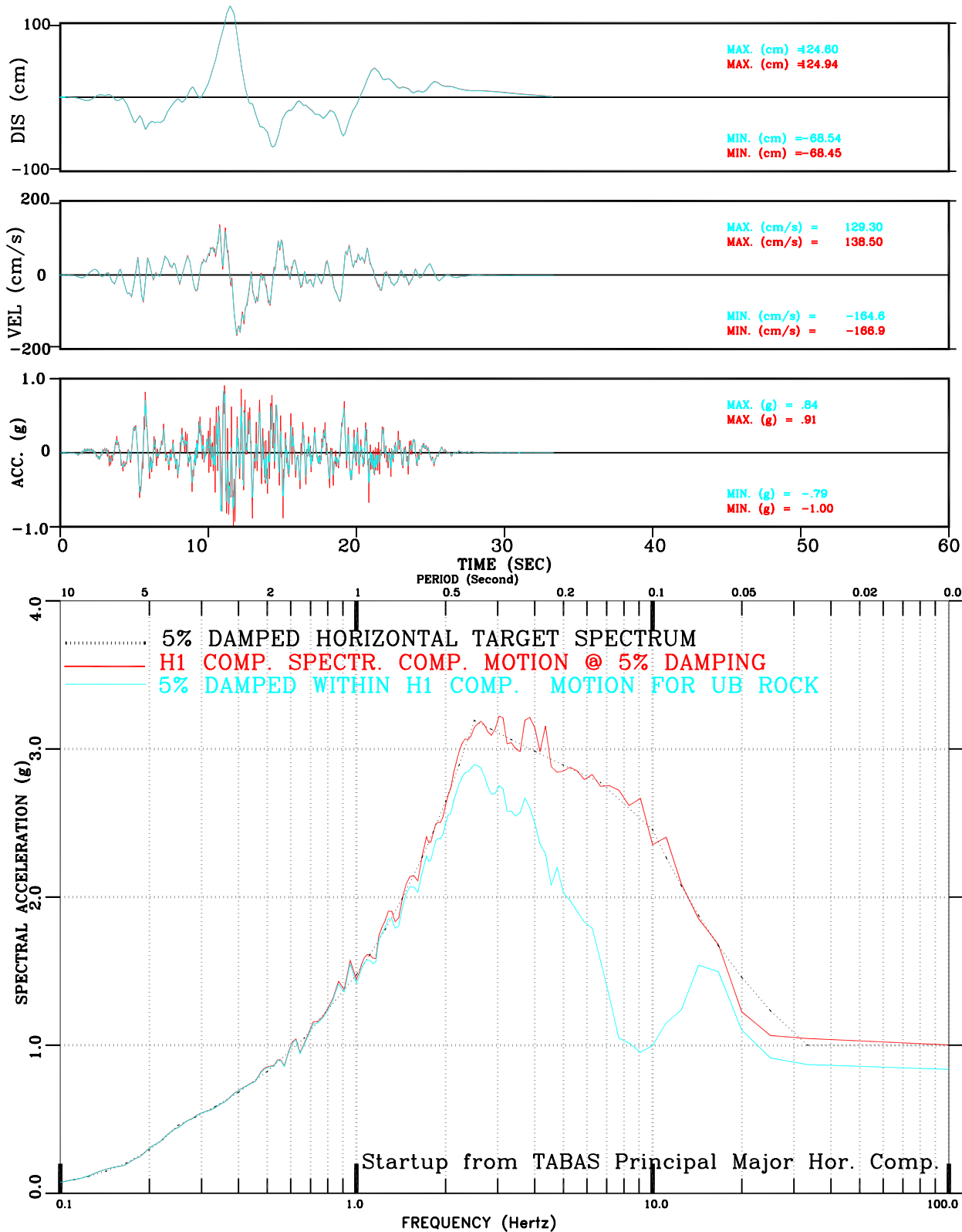


Figure III-70: Within vs. Surface Motion for UB Rock Set-1 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

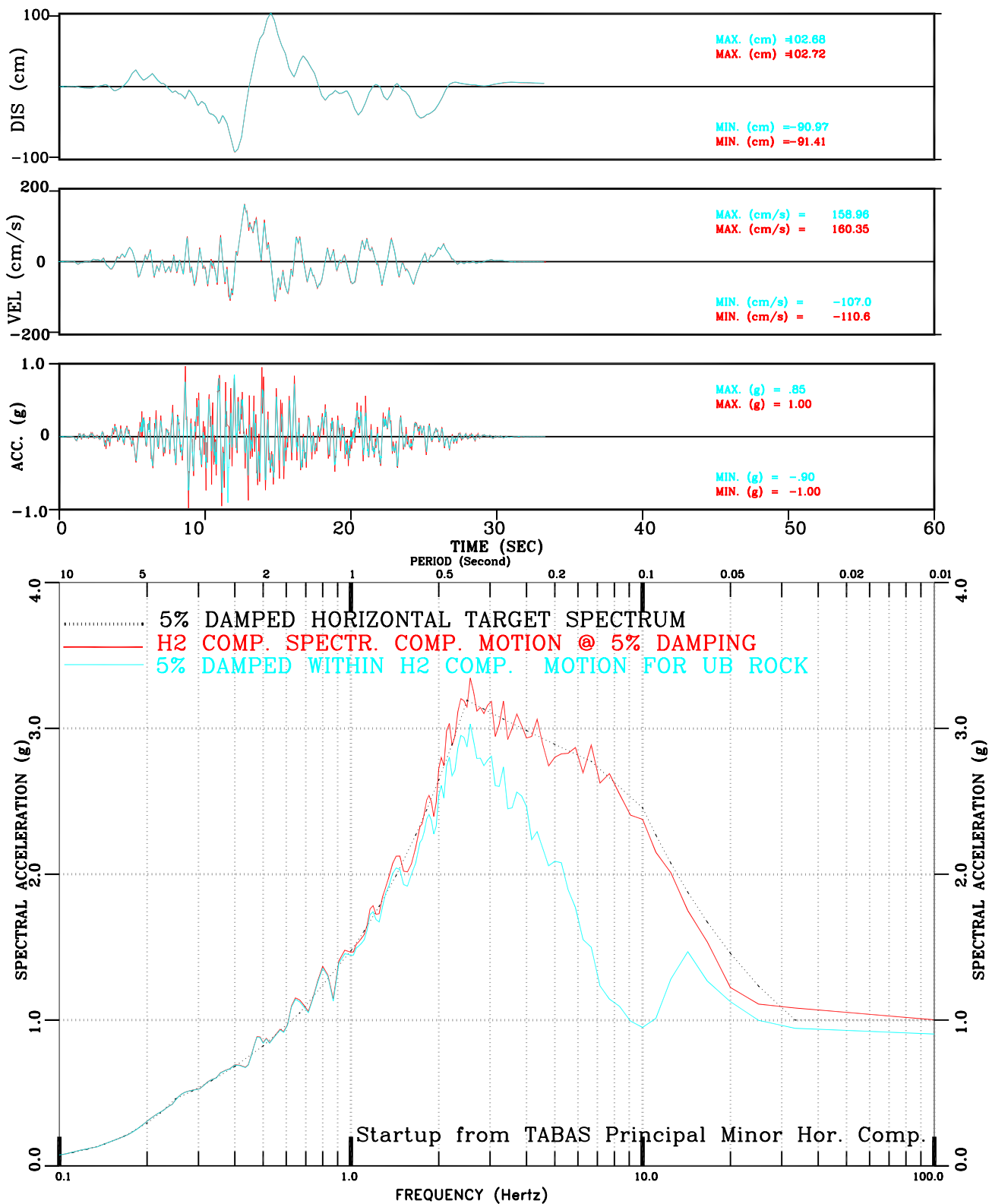


Figure III-71: Within vs. Surface Motion for UB Rock Set-1 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

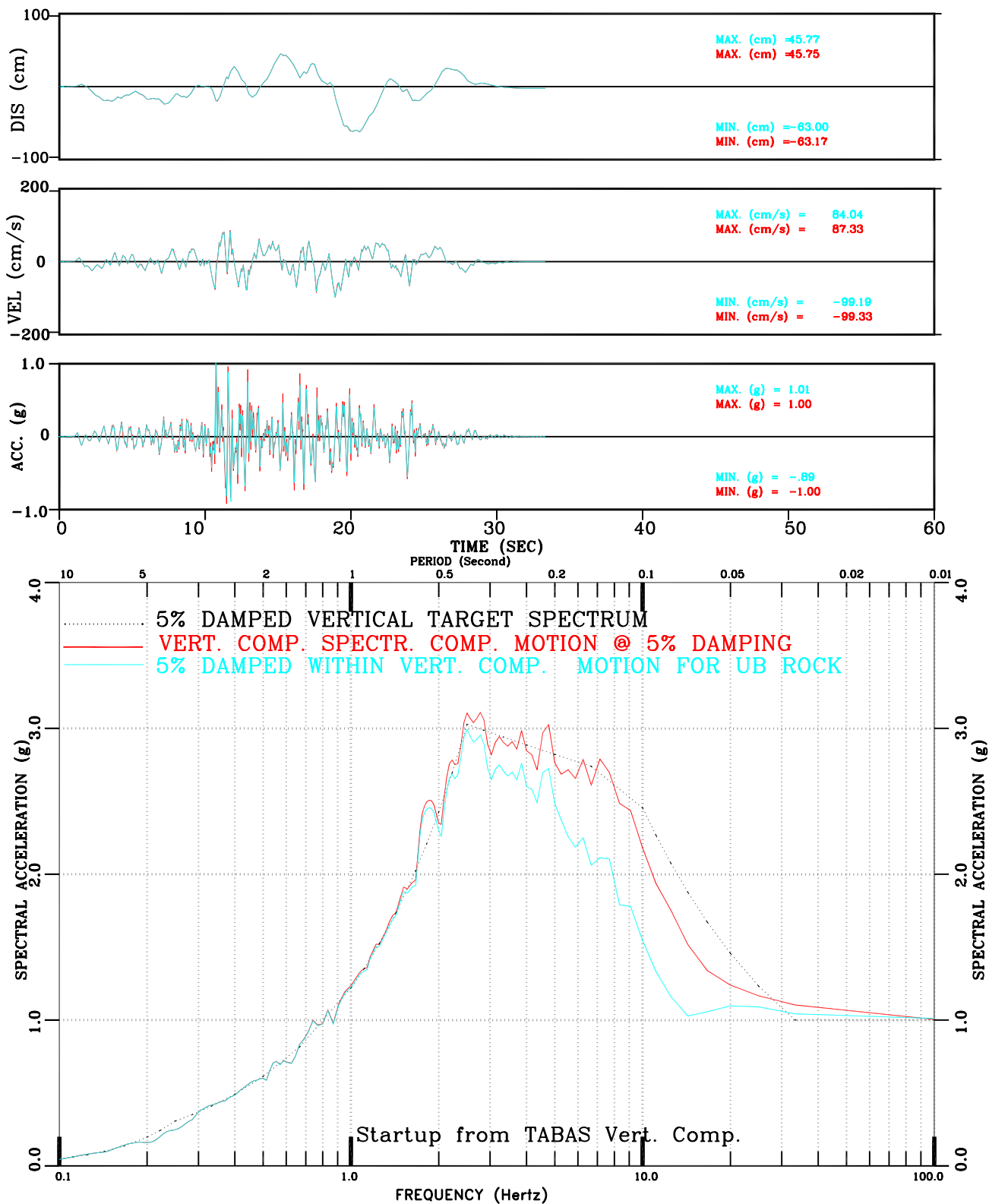


Figure III-72: Within vs. Surface Motion for UB Rock Set-1 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

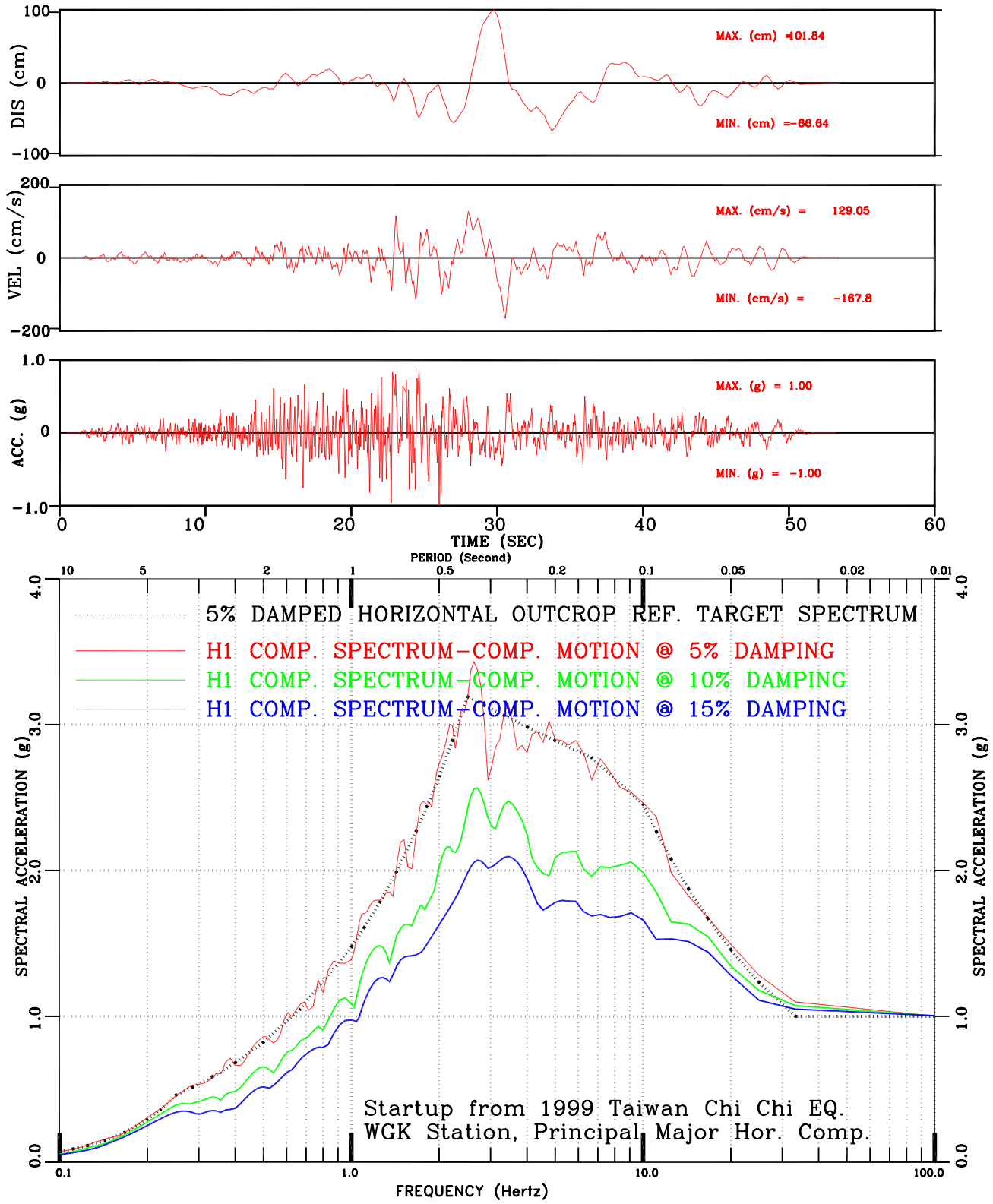


Figure III-73: Set-2 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

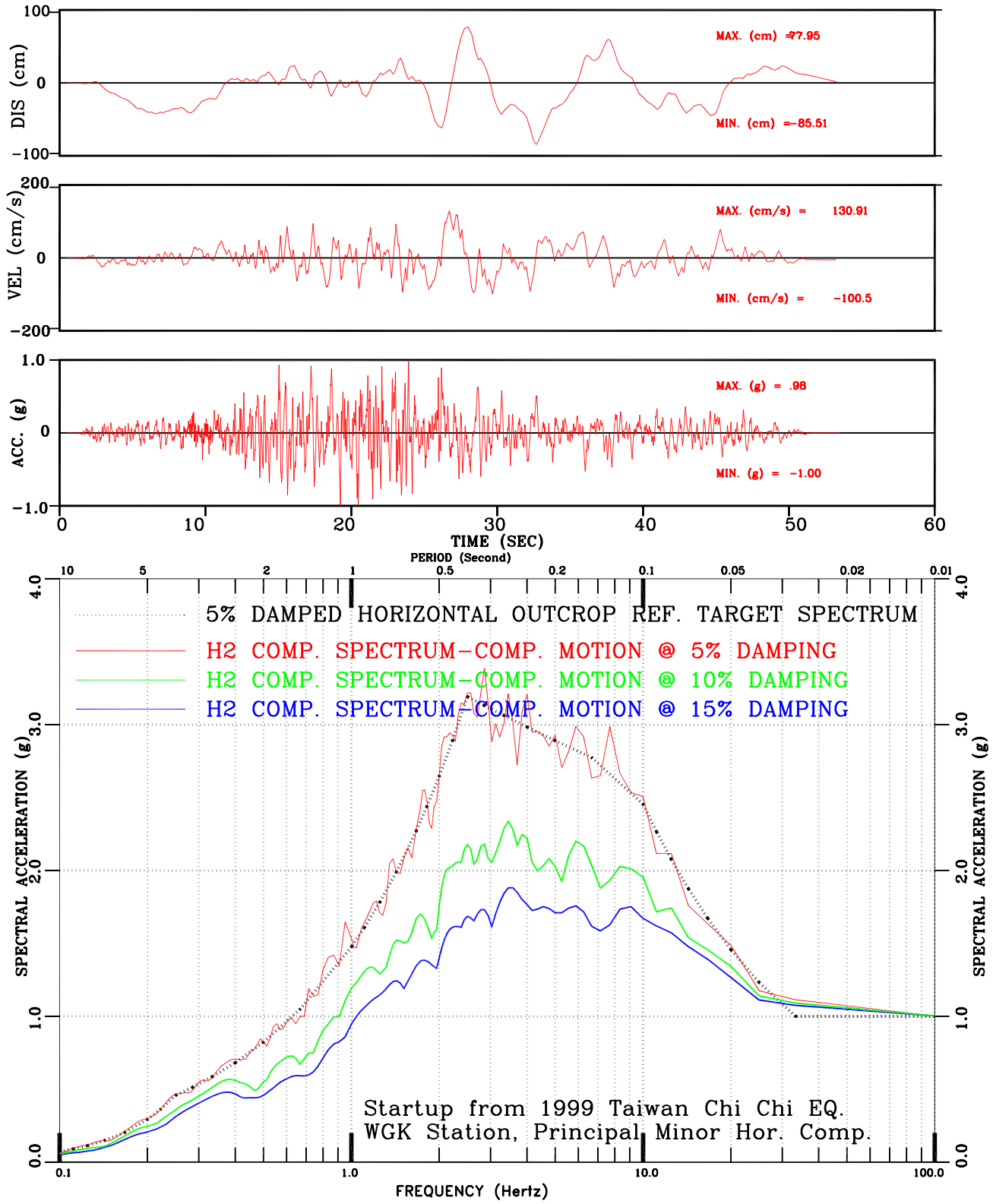


Figure III-74: Set-2 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

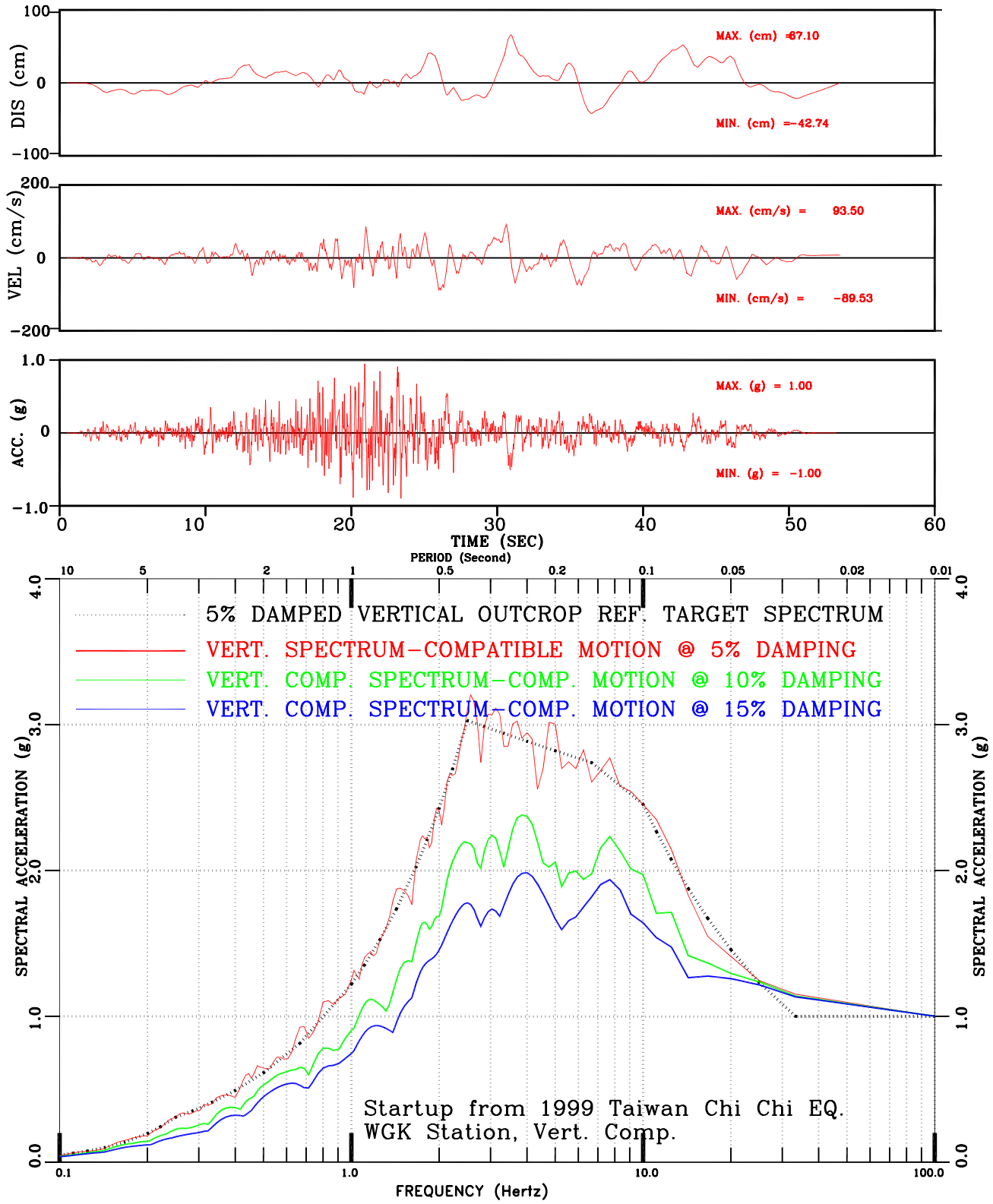


Figure III-75: Set-2 Vert Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

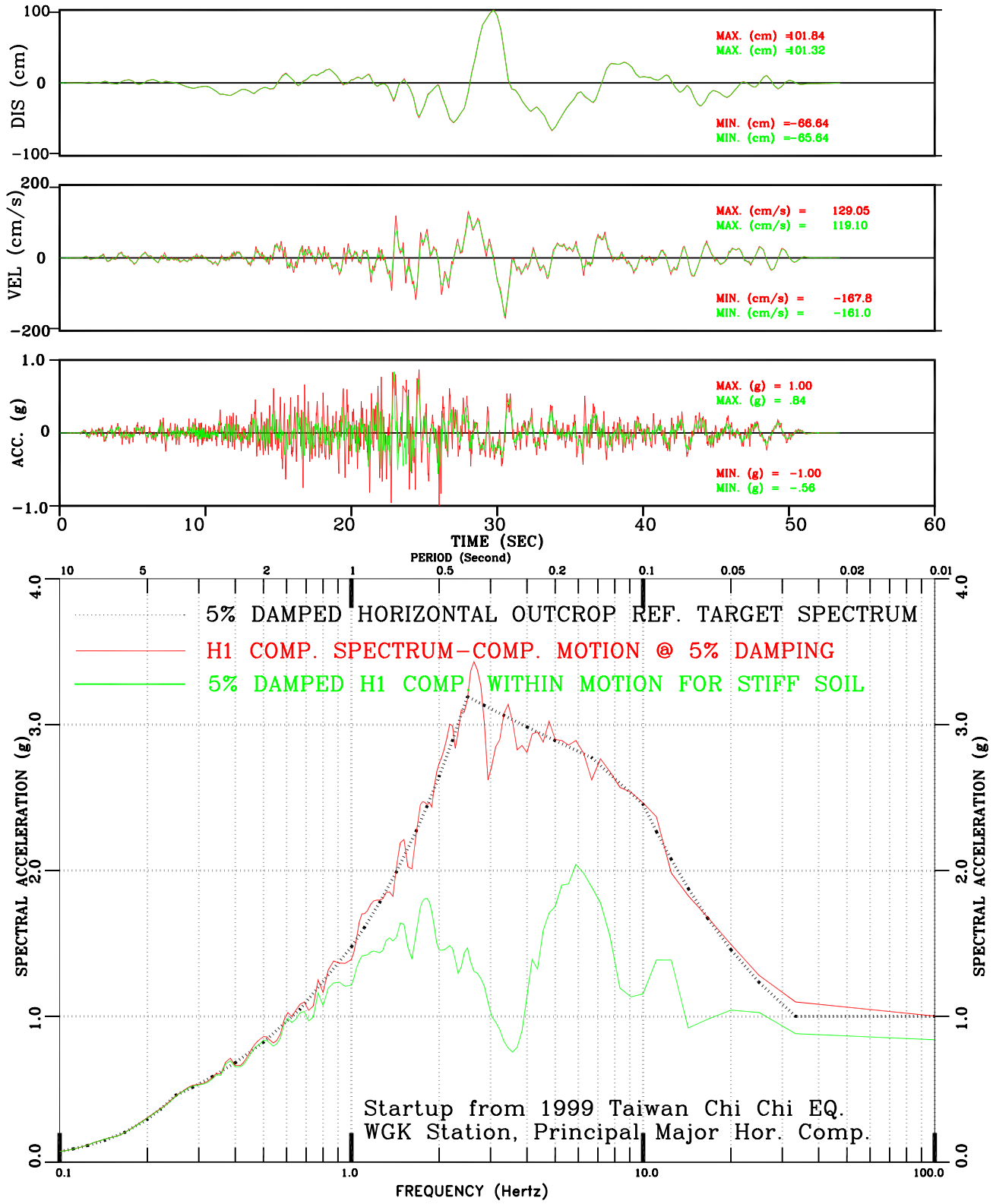


FIGURE III-76: Within vs. Surface Motion for Stiff Soil  
Set-2 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

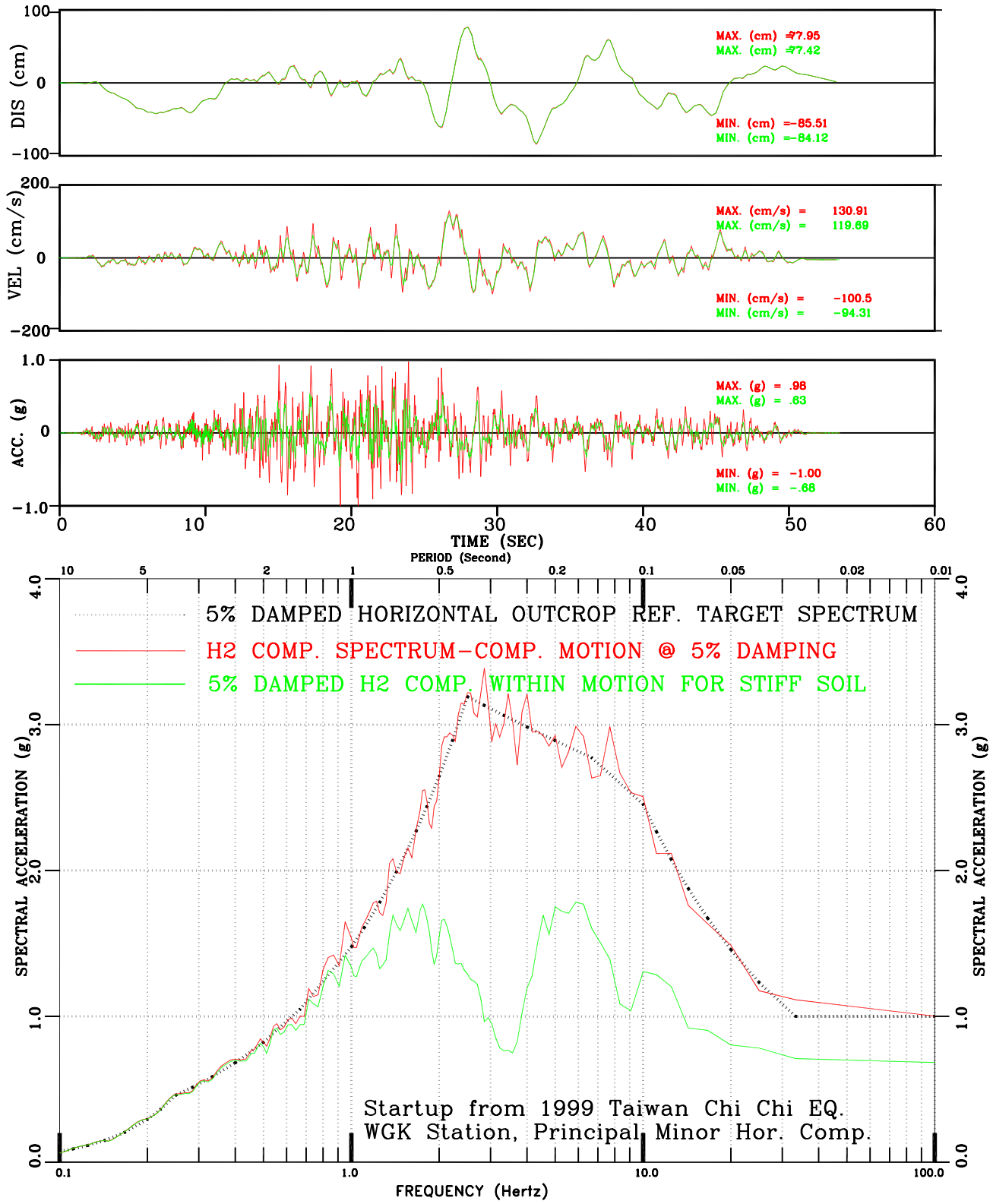


Figure III-77: Within vs. Surface Motion for Stiff Soil  
 Set-2 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape



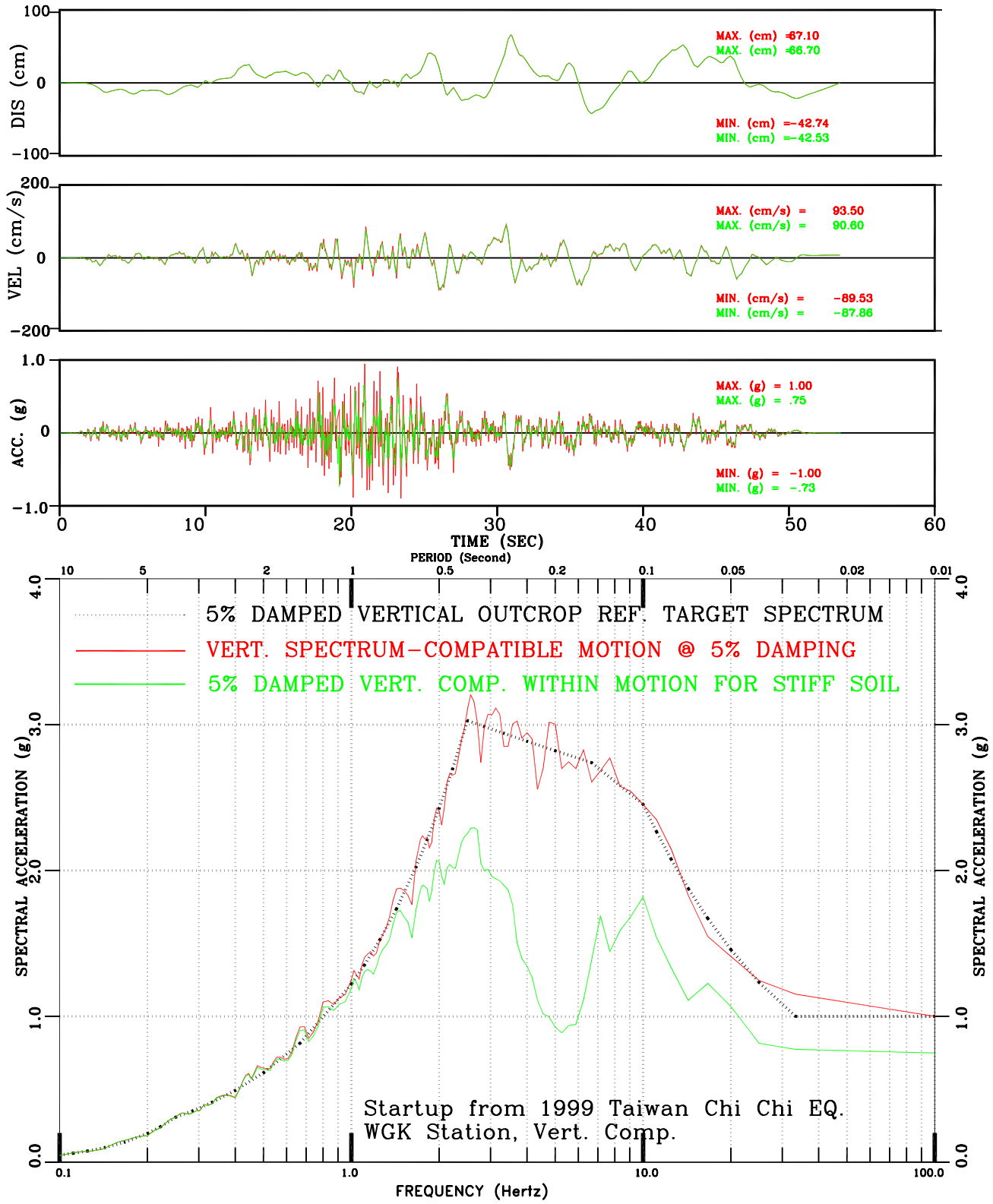


Figure III-78: Within vs. Surface Motion for Stiff Soil Set-2 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

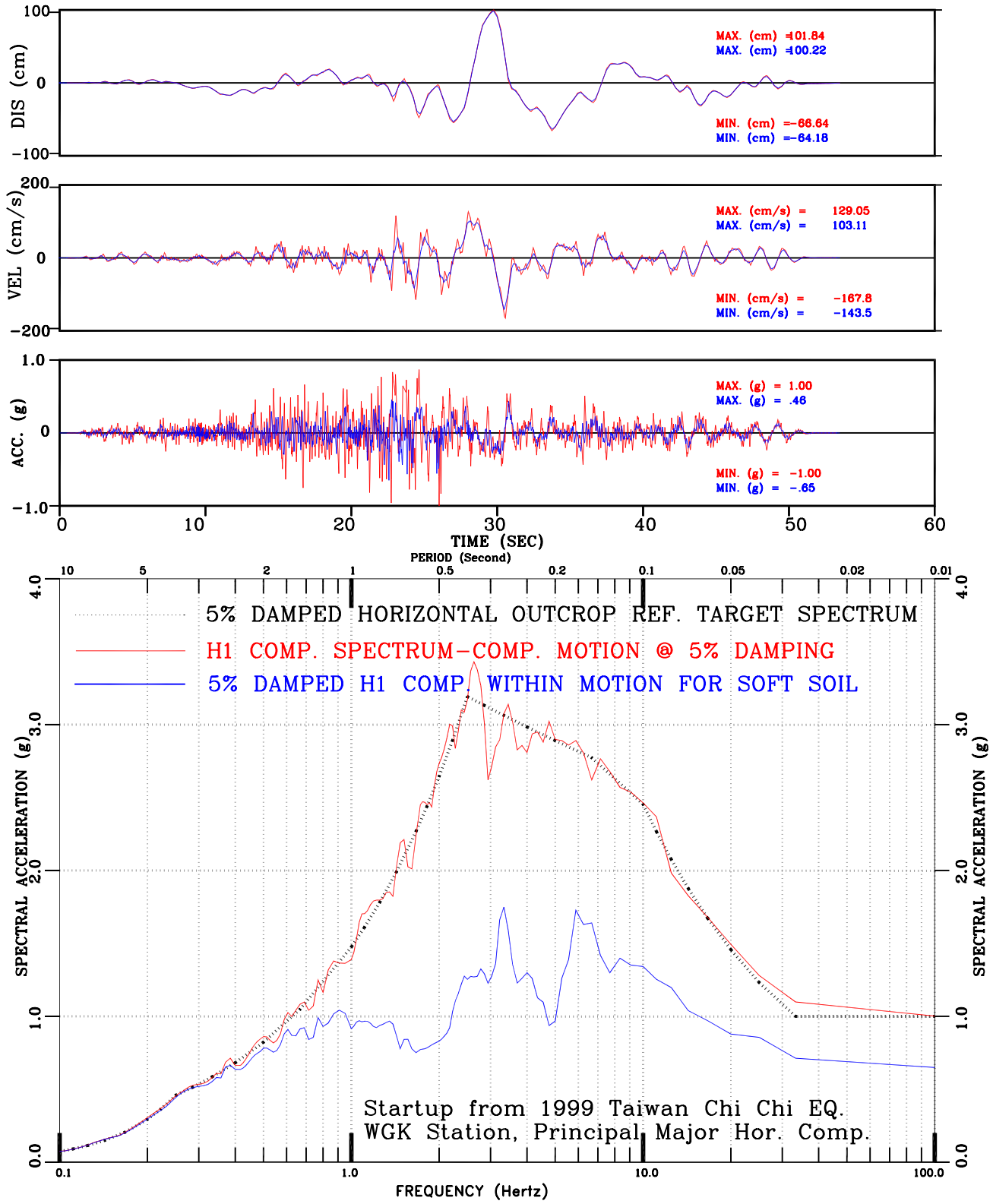


Figure III-79: Within vs. Surface Motion for Soft Soil  
Set-2 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

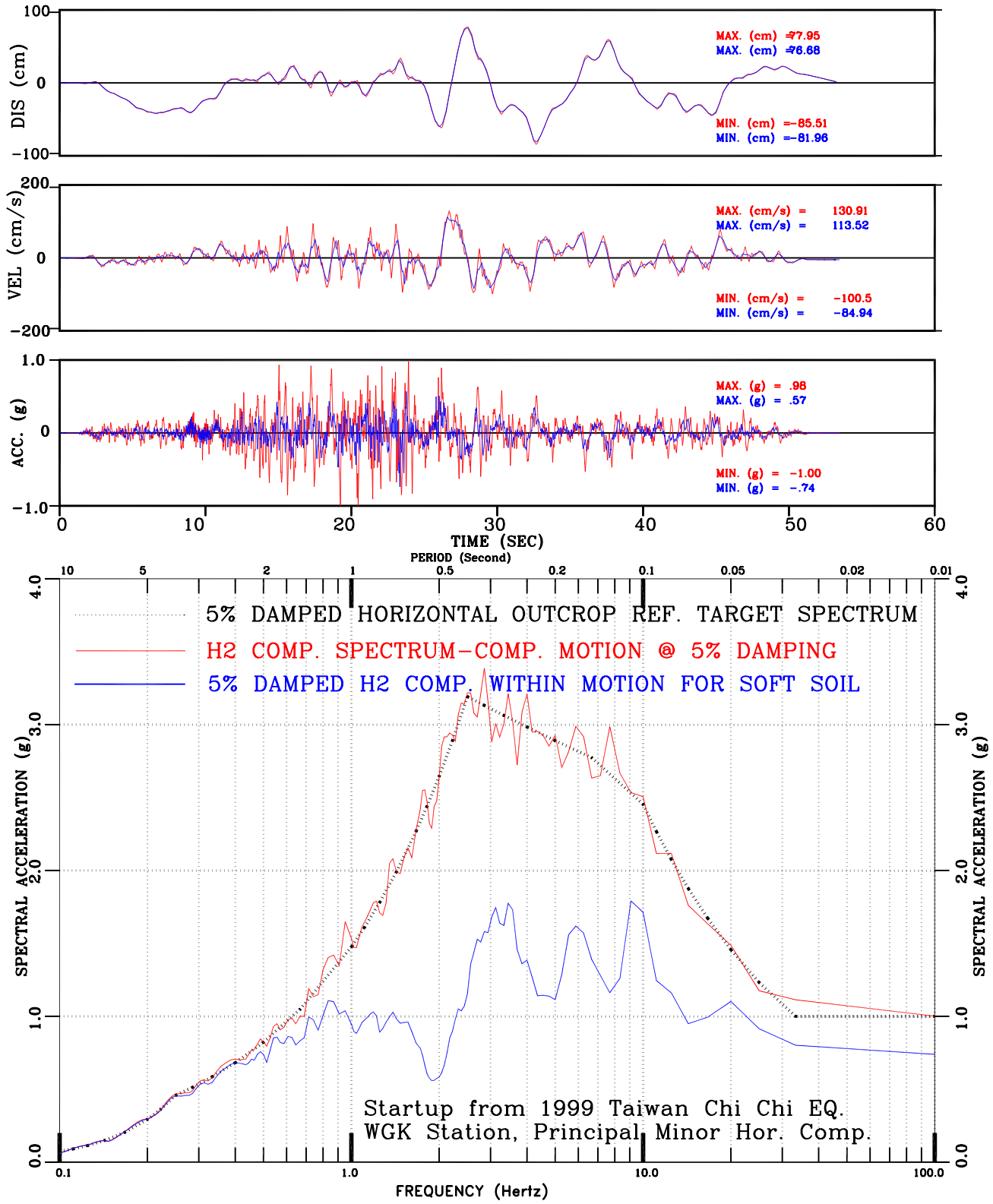


Figure III-80: Within vs. Surface Motion for Soft Soil  
Set-2 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

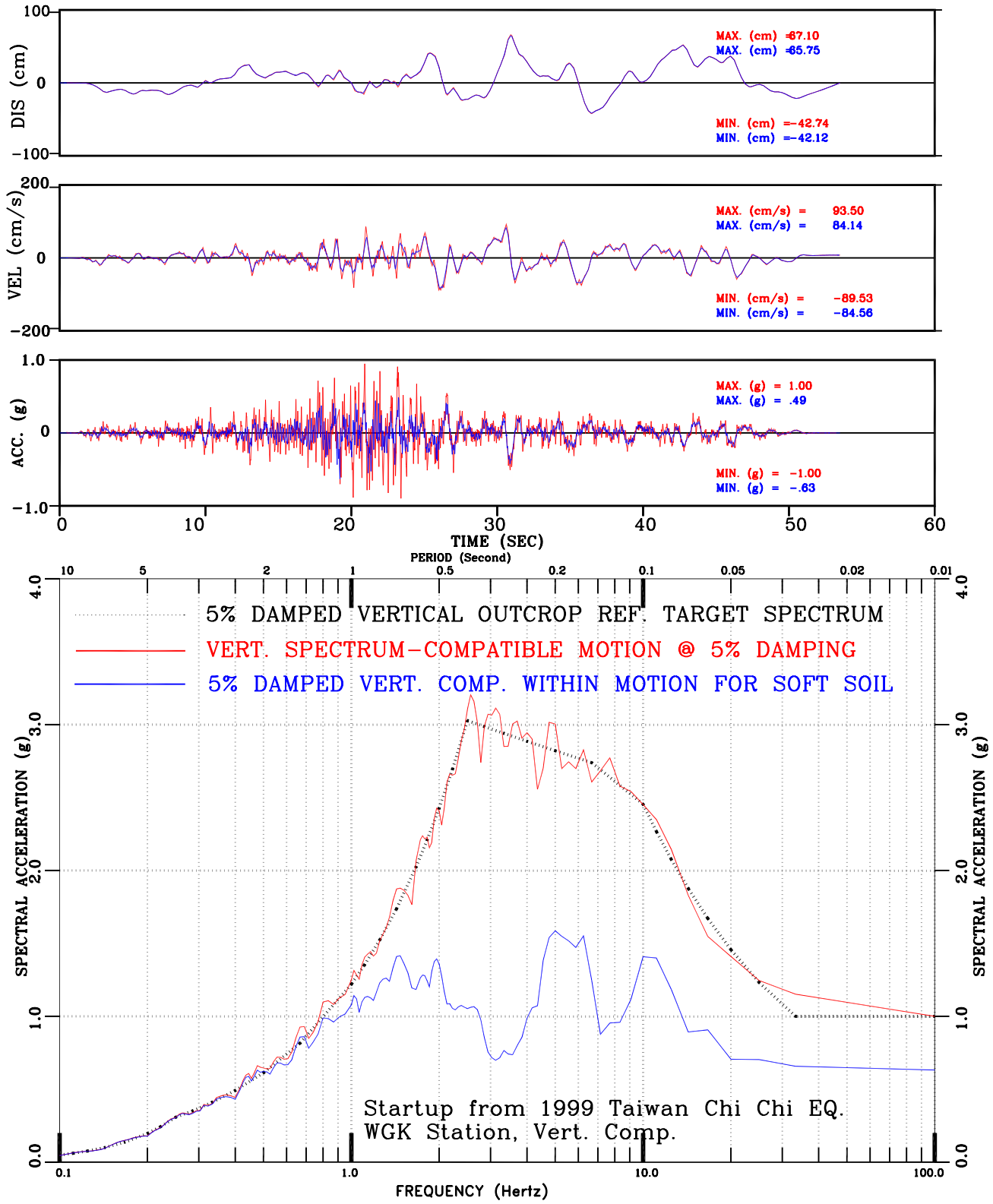


Figure III-81: Within vs. Surface Motion for Soft Soil Set-2 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

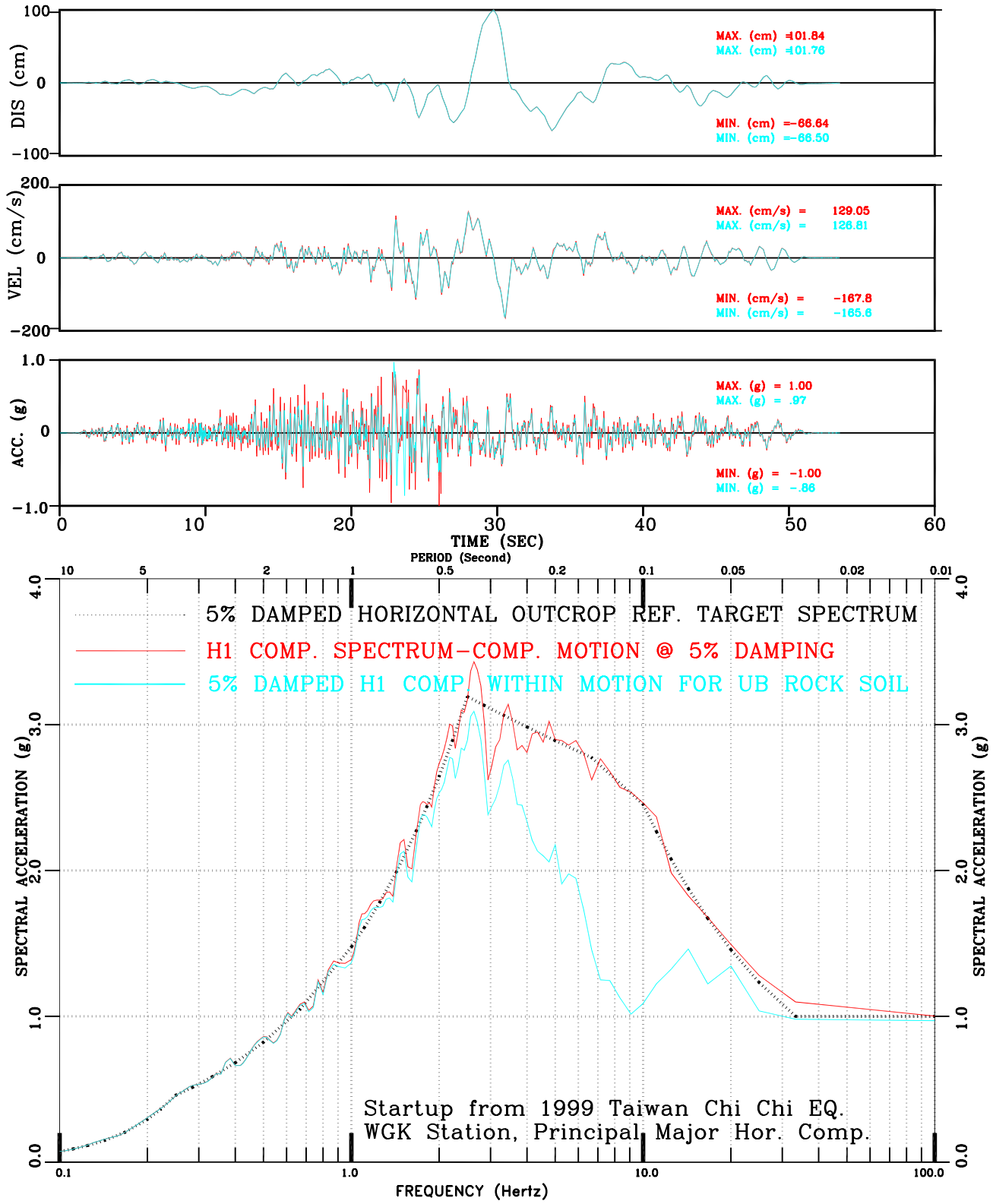


Figure III-82: Within vs. Surface Motion for UB Rock Set-2 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

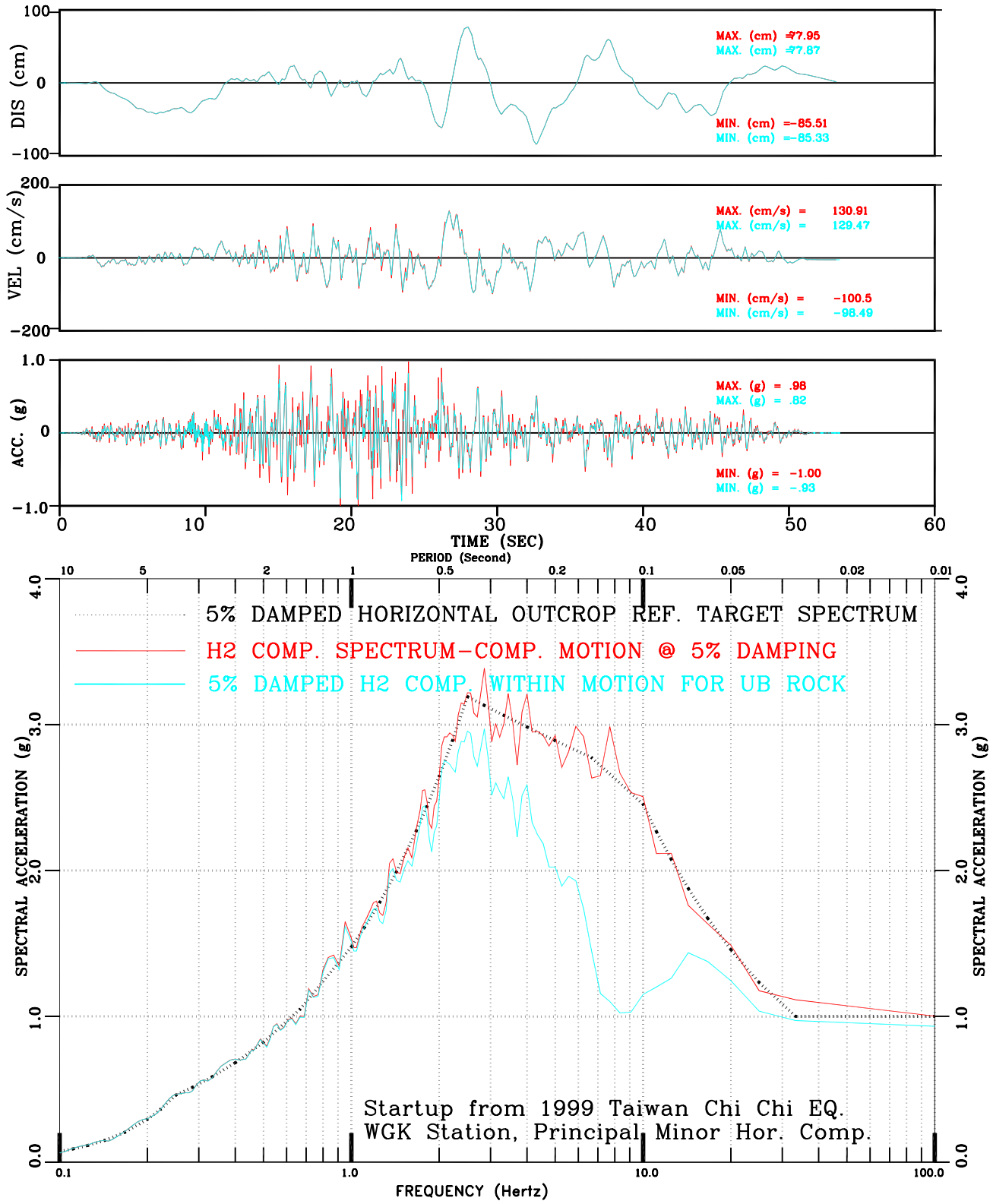


Figure III-83: Within vs. Surface Motion for UB Rock  
 Set-2 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

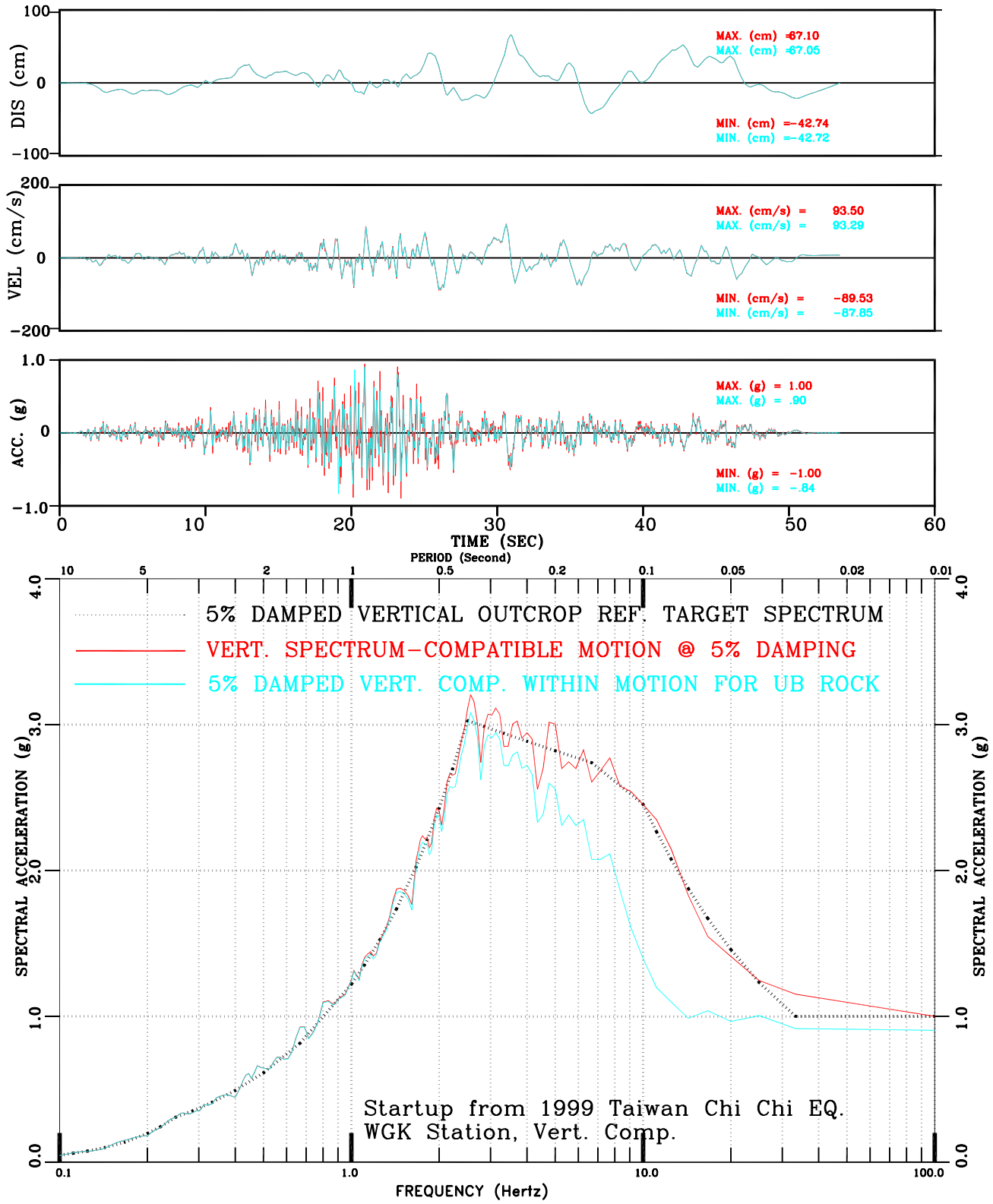


Figure III-84: Within vs. Surface Motion for UB Rock Set-2 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

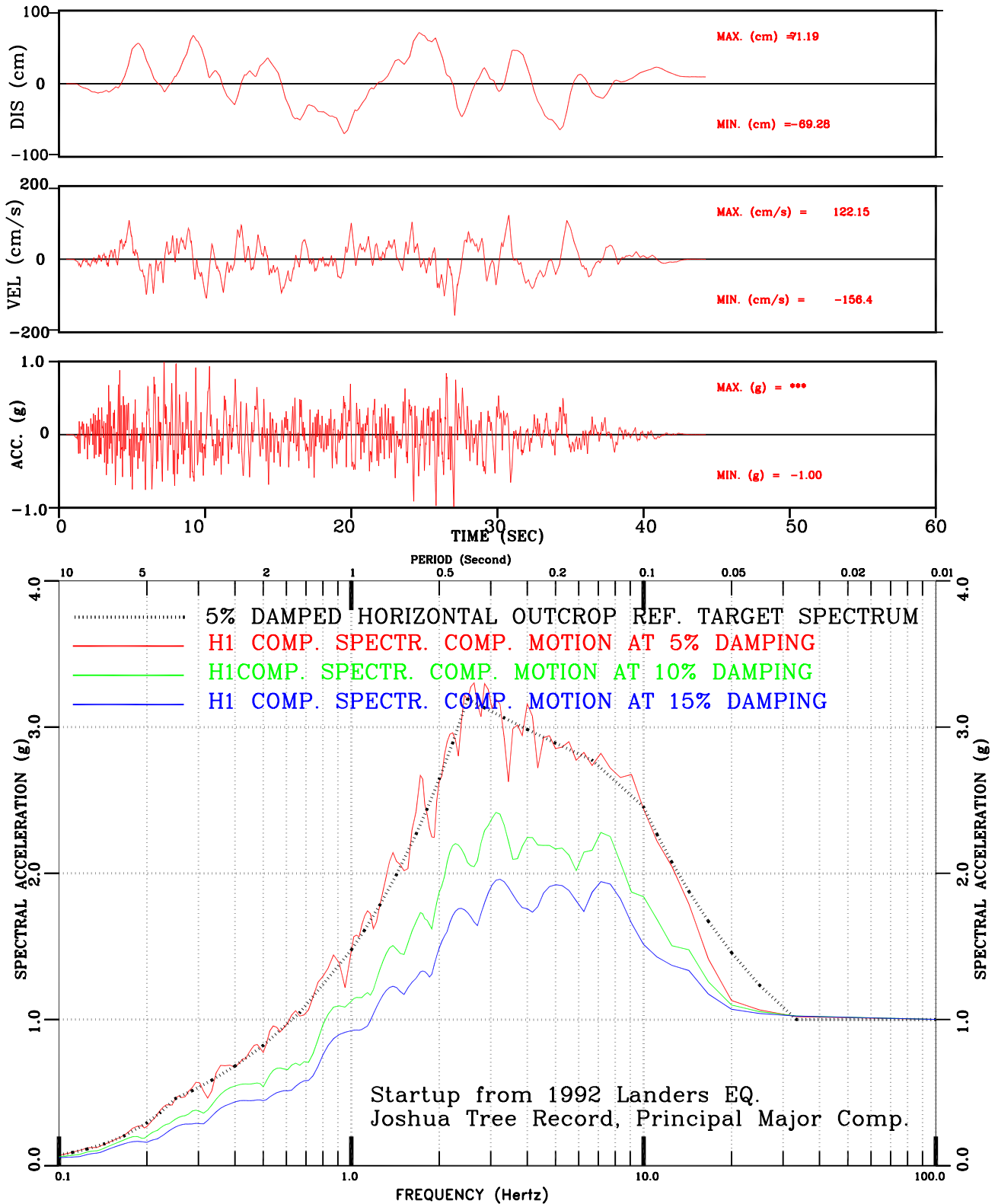


Figure III-85: Set-3 H1 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape



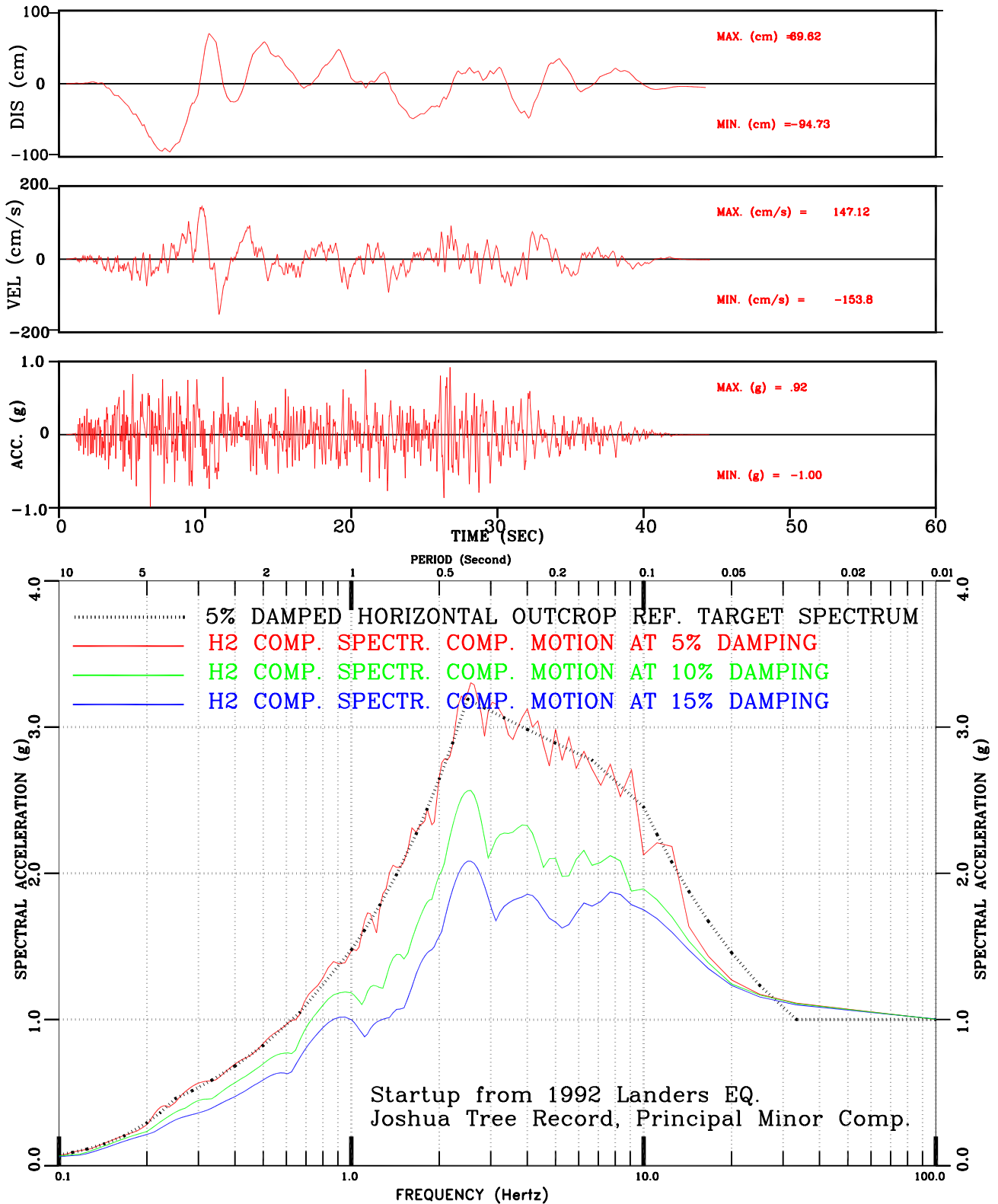


Figure III-86: Set-3 H2 Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape

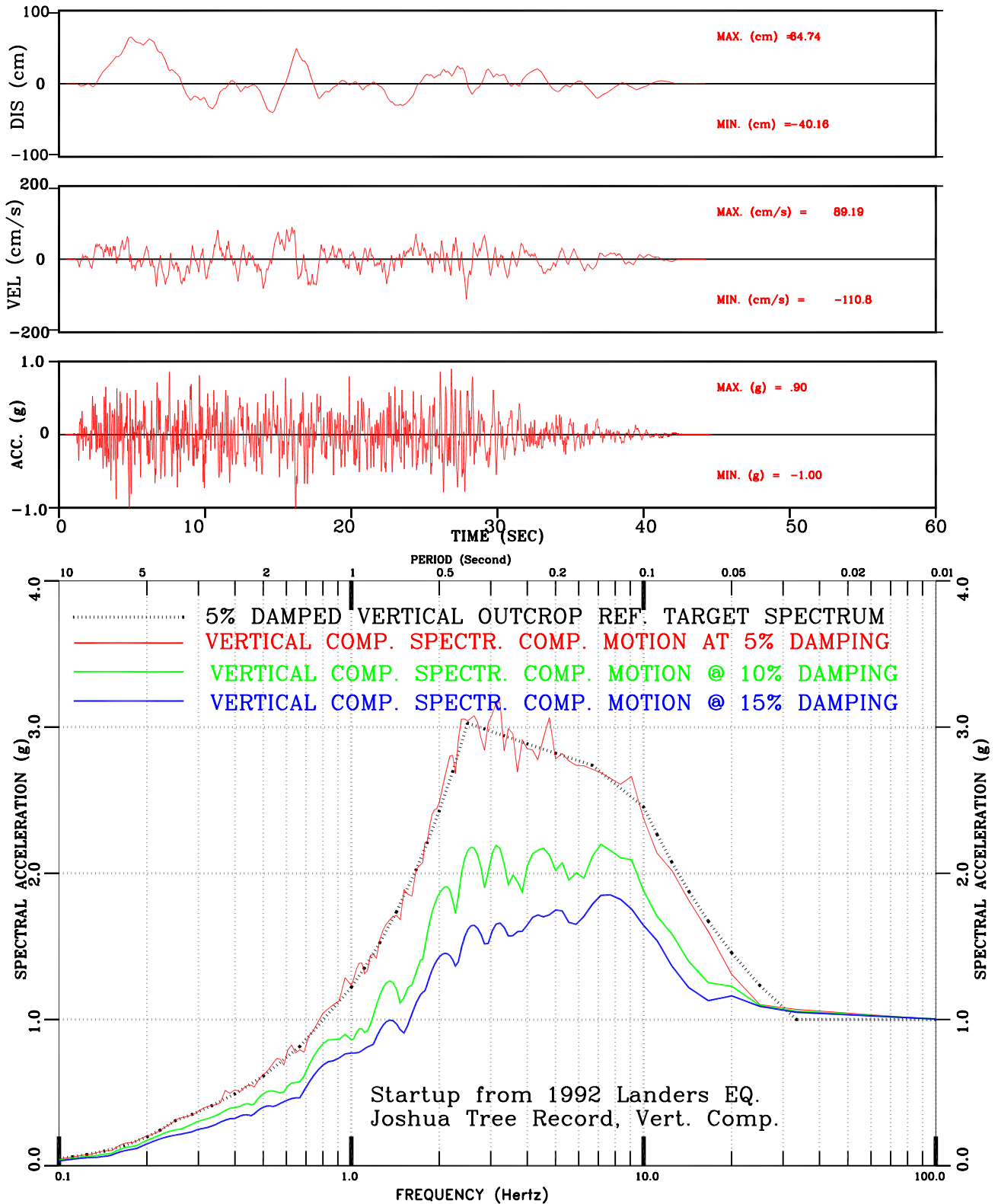


Figure III-87: Set-3 Vert. Comp. Motion Conforming to Regulatory Guide 1.60 Spectral Shape