```
function [yGen, BMatrixGen, EGen, listOfResidualBuses] = constructYGen(yNet,
listOfPVBuses, NNet, displayYNet, showInternalMatrices, displayYGen,
saveYGenMatrices, varargin)

    if ~isempty(varargin)
        nametag = strcat("_", varargin{1});
    else
        nametag = "";
    end

    listOfGenBuses = [1; listOfPVBuses];
    yNetTable = array2table(yNet, VariableNames=[string(1:NNet)],
RowNames=[string(1:NNet)]);

    if displayYNet
        format shortG
        disp(sparse(yNet));
        format default
    end

    if saveYGenMatrices
        fileType = ".csv";
        filenameYNet = strcat("processedData\ieee11\yNet", nametag, fileType);
        writetable(yNetTable, filenameYNet);
    end

    listOfAllBuses = ones(NNet, 1);
    listOfAllBuses(listOfGenBuses) = 0;
    listOfResidualBuses = find(listOfAllBuses);

    ygg = yNet(listOfGenBuses, listOfGenBuses);
    ygr = yNet(listOfGenBuses, listOfResidualBuses);
    yrg = yNet(listOfResidualBuses, listOfGenBuses);
    yrr = yNet(listOfResidualBuses, listOfResidualBuses);

    yggTable = array2table(ygg, 'VariableNames', [string(listOfGenBuses)],
'RowNames', [string(listOfGenBuses)]);
    ygrTable = array2table(ygr, 'VariableNames', [string(listOfResidualBuses)],
'RowNames', [string(listOfGenBuses)]);
    yrgTable = array2table(yrg, 'VariableNames', [string(listOfGenBuses)],
'RowNames', [string(listOfResidualBuses)]);
    yrrTable = array2table(yrr, 'VariableNames', [string(listOfResidualBuses)],
'RowNames', [string(listOfResidualBuses)]);

    if showInternalMatrices
        display(yggTable);
        display(ygrTable);
        display(yrgTable);
        display(yrrTable);
    end
```

```
    if saveYGenMatrices
        fileType = ".csv";
        filenameYgg = strcat("processedData\ieee11\Ygg", nametag, fileType);
        writetable(yggTable, filenameYgg);
        filenameYgr = strcat("processedData\ieee11\Ygr", nametag, fileType);
        writetable(ygrTable, filenameYgr);
        filenameYrg = strcat("processedData\ieee11\Yrg", nametag ,fileType);
        writetable(yrgTable, filenameYrg);
        filenameYrr = strcat("processedData\ieee11\Yrr", nametag, fileType);
        writetable(yrrTable, filenameYrr);
    end

    yGen = ygg - ygr/yrr * yrg;
    BMatrixGen = -imag(yGen);
    nPV = length(listOfPVBuses);
    EGen = cell(nPV + 1, 1);
    for i = 1: nPV+1
        EGen{i} = [1:i-1 i+1:nPV+1];
    end

    yGenTable = array2table(yGen, VariableNames=[string(listOfGenBuses)],
RowNames=[string(listOfGenBuses)]);

    if displayYGen
        display(yGenTable);
    end

    if saveYGenMatrices
        fileType = ".csv";
        filenameYGen = strcat("processedData\ieee11\yGen", nametag, fileType);
        writetable(yGenTable, filenameYGen);
    end

end
```